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A COURSE IN ARGUMENTATIVE WRITING. By GERTRUDE BUCK, Ph.D., *Instructor in English at Vassar College.* 12mo. 80 cents, net.

A COURSE IN EXPOSITORY WRITING
By GERTRUDE BUCK, Ph.D. (*University of Michigan*), and ELISABETH WOODBRIDGE, Ph.D. (*Yale*), *Instructors in English at Vassar College.* 12mo. \$1.00, net.

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A COURSE IN
ARGUMENTATIVE WRITING

BY
GERTRUDE BUCK, PH.D.

Instructor in English in Vassar College



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PREFACE.

THIS book arises out of certain beliefs concerning the study of argumentation, which, though perhaps not wholly novel, have as yet found no recognition in the literature of the subject. The first of these beliefs is that the principles of argumentation should be derived by the student from its practice before the practice is made to conform to the principles. In short—one may as well acknowledge it—a firm faith in the so-called “inductive method” as applied to argumentation lies at the root of this treatise. Such a faith implies, of course, that the student should be asked to dissect out logical formulæ for himself from his own unconscious reasonings, using them, when discovered, to render those reasonings more exact. The construction and the rough analysis of arguments would, similarly, precede the formulation of any principles of persuasion.

Such a plan as this, it will be noted, assigns to the student a task at once more difficult and more stimulating than that which the usual methods require. He is not asked simply to accept certain logical formulæ on the authority of text-book or teacher and apply them to his own writing; but first to quarry out these formulæ from his own writing and then to use them for such modification of that writing as may seem necessary. His duty is thus

doubled; but it is also enlivened by the zest of discovery. He deals not with the dead products of other people's labor, but with the fruits of his own first-hand observation and thought. In his study of the processes of reasoning he reasons himself, inductively as well as deductively,—an issue by no means inevitable under the old system.

From the conviction that the student should formulate his own principles of argumentation follows the second article of faith: that the subjects set for argument and the material used for analysis should be not remote from the student's natural interests, but interwoven with his daily experiences. If the student is to gain his principles from his unconscious practice, it follows that he will, for a time at least, be concerned with arguments about the probable score of the coming football game or the fairness of a certain examination rather than the desirability of a high protective tariff for the United States or the iniquity of free silver. Whenever these latter topics come to have a real and first-hand interest, they may well be used; but simpler and more intimate questions will usually serve better to disclose the typical processes of reasoning and argument, not obscuring them by needless bulk and complexity in the subject-matter. When once these typical processes have become thoroughly familiar in their simpler aspects, they may easily be traced through the mazes of an intricate and voluminous argument in politics or sociology. Work of this more ambitious type, however, properly follows the elementary study of the principles of argumentation with which we are here concerned.*

The third canon of which this book is exponent is also

* The sketch found in Appendix C of a course given conjointly by the departments of Economics and of English at Vassar College will furnish some suggestions for more advanced work in argumentation.

involved, though somewhat indirectly, in the first. This is the conviction that the logical basis of argumentation should be ultimately referred to psychology. This is an old word in philosophy, but it has not yet found place in treatises on argumentation. The logical substructure of arguments is universally recognized, but seldom is the psychological stratum beneath that pointed out, and thus, cut off from its deepest roots, logic has come to seem rather like a dead tool than like a living expression of thought. Beginning, however, as this study of argumentation does, with the unconscious reasonings of the student, it is bound to see them as they are, not compositions carefully planned to exhibit logical principles, but natural outputs of typical mental processes. Each argument is referred not only to its logical but to its psychological antecedent, so that the maxims and formulæ, usually regarded by the learner as malign inventions of Aristotle, represent to our student rather the ways in which real people really think. In fact, he himself thinks and argues in these ways—he has often caught himself doing so; and from this fact the abstract logical equations acquire a distinct flavor of personal interest. Knowing them thus inwardly, not as a mere external imposition upon his memory, he has them better in hand as a tool. He uses them not gingerly, but with the dash of intimacy.

Some explanation or defense of the syllogistic brief as used in the text may be demanded. The adoption of this form of analysis is due to the fact that it brings into clear relief the actual structure of an argument, which the ordinary brief so often allows to be forgotten. The syllogistic brief insists, more strenuously than does any other form, upon an exact representation of the entire reasoning process which underlies the argument, with all the relation-

ships and interrelationships among its various parts. What is needed, at least for the beginner, is a brief that first represents the argument as a unit, and then shows with precision how every point in the proof leads directly or indirectly to the single conclusion. This the syllogistic brief accomplishes. It reveals the comparative rank of all arguments and sifts out those which are irrelevant by virtue of its insistence upon the exact bearing of each point upon the main conclusion. This the ordinary form may also be compelled to do, if skillfully handled, and the more advanced student can safely be trusted to use it, having recourse to the syllogistic brief only in cases of doubt. But for the immature analyst of argument the more explicit and detailed method commends itself.

The emphasis laid by the exercises upon the exact analysis of trains of reasoning and arguments should perhaps be still further heightened by an explicit statement of its purpose. No part of the study of argumentation seems to the student more difficult than the correct analysis of his own arguments and of those of other people. But nothing is more indispensable than this to a mastery of argumentation as a practical art. The rapid unfailing insight into the core of an argument, the swift separation of the essential from the non-essential, the sure recognition of major and minor points in the proof of any question, these are the marks of a master logician, or one might say of a trained mind in any field. And it is to such mastery of argument and of thinking that exact analysis tends. The student should be trained to it by every means, analyzing first the simplest arguments, next those with one subsidiary train of reasoning supporting the first, later those containing not only a secondary but a tertiary grade, and so on until the complexest arguments may

be resolved at once into their ultimate elements. It may be added that the teacher should by all means supplement the arguments set for analysis in the various exercises by many others drawn from current reading and conversation. The study of argumentation is perhaps most effectually quickened by a judicious selection of arguments and subjects for argument with reference to topics of current interest. The daily newspapers and the magazines furnish always abundant supplies of timely material for a class in argumentation. Toward the close of a course, if the students are sufficiently mature, the complete analysis of such popular arguments as those involved in books like Bellamy's *Looking Backward* or Kidd's *Social Evolution* may safely be attempted.

A considerable amount of oral debating is found to be useful as complementary to the writing. Often an impromptu debate may be held upon a subject before it is assigned for written argument. The question is then talked over as well as thought out, new points of view are suggested and objections raised, so that the written argument becomes better digested than is usually the case when put to paper without such preliminary working over. The writer's own belief in the efficacy of debating as an aid to the study of argumentation may appear from an account of the arrangement of the course as given in Vassar College. The class meets three times a week, twice in separate sections for quiz on the text, for writing and criticism, once for an exercise in which the whole class participates, usually a debate, either formal or impromptu. These debates are not only regarded by the students as the most interesting feature of the course, but they seem fully to have justified their institution by the impetus they have given to the written work.

The course as here laid down is intended to occupy the work of one semester, the class meeting three times a week. It might, however, by the multiplication of exercises and the study of logical principles not discussed at all in this book, be indefinitely expanded.

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CHAPTER I.

ARGUMENTATION.

WE often find ourselves attempting to convince another person that something is or is not true, that a certain course of conduct ought or ought not to be pursued, or that a certain result will follow a certain action. Only yesterday, it may be, you persuaded another member of your class that Fred Ostrander ought not to be elected class treasurer, or tried to prove to your father that geometry is a useless branch of study.

If you recall the process by which you induced your classmate not to vote for Fred Ostrander for treasurer, you will remember that it was something like this. You told him that Fred was unbusinesslike in his methods, never paying his class dues till the last minute, not because he hadn't the money, but because he just forgot to. And then he never wanted a receipt for them, and never could remember whether he had paid them or not. He was the most absent-minded member of the class and didn't come to the meetings half the time. Of course he was popular, but what was wanted for a treasurer was a good, prompt, wide-awake business-man, who would collect all the dues on time, keep the books ship-shape, be on hand at every

meeting, and know to a cent just how the class stood financially. No man who couldn't do these things ought to be treasurer. And it was plain as day that Fred couldn't do one of them. So your classmate agreed that Fred assuredly ought not to be elected treasurer of the class.

This was what you had been working for—to make your classmate believe the thing that you believed, namely, that Fred Ostrander ought not to be elected treasurer. You wanted to transplant your conviction into his mind. But you knew at once that it was impossible to do this simply by expressing your own belief. You might have said to your classmate a dozen times that Fred Ostrander ought not to be elected, without making him accept that statement. He would be likely to inquire at once “Why?” and until you could answer that question satisfactorily, he would refuse to believe in your conclusion.

But you knew he would want your reasons, so you gave them at once without even being asked for them. You had come to believe that Fred ought not to be elected because you had noticed in him certain unbusinesslike habits and characteristics. In other words you had made these observations before you came to the conclusion that Fred ought not to be elected. They had formed part of a process of thinking which ultimately led you to the belief you desired your classmate to accept. They were the first step in the path that induced you to the conclusion. Hence, when you wished some one else to reach this belief or conclusion, you naturally conducted him over this same path until he arrived at its goal. He might perhaps have reached it by another road, but you were familiar with this one, having just traversed it your-

self, and knew that it would issue in the desired conclusion, hence you naturally guided the steps of your friend into it.

This is perhaps a typical instance of the process called argumentation. It is the act of establishing in the mind of another person a conclusion which has become fixed in your own, by means of setting up in the other person's mind the train of thought or reasoning which has perviously led you to this conclusion.* Here we have a statement both of the end and of the means employed for attaining the end. The goal is the establishment of a certain belief or conclusion in the mind of the hearer or reader. But as soon as this goal is clearly recognized the question arises—How is it to be attained? How can this conclusion be implanted in the mind of the reader or hearer? It is evident at first glance that no conclusion of a process of thought can be introduced bodily into any person's mind without the train of reasoning which

* In its statement of the end to be attained this definition agrees substantially with such as the following: "Argumentation is the art of producing in the mind of some one else a belief in the ideas which the speaker or writer wishes the hearer to accept." (Baker, *Principles of Argumentation*, p. I.) "Argumentation is the process of proving or disproving a proposition." (MacEwan, *Essentials of Argumentation*, p. I.) In both of these definitions, however, the means to attaining the end remains unspecified.

It may further be noted that these definitions do not insist upon the speaker's having previously arrived at the conclusion he would establish in the hearer's mind. It is, however, manifestly impossible that a speaker should be able to conduct his hearer to a goal which he himself has not, at least in imagination, reached. Even when he wishes to convince another person of the truth of a proposition which he himself does not believe, he must imagine himself as having come to belief in it, and trace out the route thereto, in order that he may be able to act as guide.

naturally leads to it. A conclusion is not an isolated thing, which can be thrown into another mind from without. A belief is not accepted by one who sees no justification for it. To convince any person of the truth of a proposition requires that he reach that proposition himself as the logical outcome of some process of thought. Hence it is necessary, if one wish to persuade another person to a certain conclusion, that he set up in that person's mind a train of reasoning which is bound to issue in this conclusion.

This, then, is the problem of argumentation: given the conclusion which is to be established in the mind of the hearer or reader, to find the train of ideas which is bound to lead to this conclusion. The solution which at once presents itself is that of using the train of ideas which, in the speaker's mind, has already served to establish the conclusion in question. Let us say, for instance, that the speaker has come to the conclusion that teachers in the primary schools of this country receive very small salaries. If he wishes to convince another person of the truth of this judgment, he will naturally cite the various cases in which such teachers are poorly paid, which, coming to his knowledge, have induced him to this belief. Or if he has become convinced, as in the previous illustration, that Fred Ostrander ought not to be elected treasurer of the class, he will doubtless attempt to bring another person to this view by alleging the reasons which have moved himself, namely, Fred's careless habits, his unpunctuality and irregularity in attendance, with perhaps still other disqualifications of this sort.

This is the most obvious way of finding a train of reasoning pretty certain to issue in the conclusion to be established,—looking into one's own mind and noting the

series of ideas which there have actually established the conclusion for one's self. One feels assured that this series should lead to the desired conclusion in another person's mind simply because in his own it has already done so. And, in view of the fact that the mental processes of all normal people follow the same general laws, this assurance is by no means unreasonable. Certain difficulties should, however, be at once noted.

In the first place there is the difficulty of exact knowledge about one's own mental processes. One may think he can tell exactly what train of thought has preceded his arrival at a certain conclusion; but can he be sure that he has not overlooked his real starting-point or included considerations which might indeed be expected to influence him, but which actually had no weight, ignoring the points which were the true determinants of his conclusion? Can he assert with absolute assurance that he has followed the order in which his ideas moved to the conclusion, not transposing or omitting or interpolating any? It is a ticklish matter to determine without other aid than that of one's own impressions. Further assistance may, however, be derived from a knowledge of the typical ways in which other people come to conclusions. Granting that one's fundamental thought-processes do not differ essentially from those of his kind, it is possible to clarify and correct one's impressions of his own trains of reasoning by a knowledge of those typical activities of mind common to all thinking people. The science of these typical activities of mind, commonly called logic, must, then, be detailed to supplement introspection in our search for the train of reasoning which shall lead another person to a given conclusion.

A second difficulty in the process of argumentation is

also solved by the assistance of logical principles. Granting that the writer's train of reasoning is clearly and correctly perceived by him, can he be in any way assured that it is not exceptional, different from the thought-processes of other people, and hence not warranted to bring about in another's mind the conclusion it yielded to the writer? Our general postulate that the essential modes of thinking are common to all normal minds renders this belief unlikely, indeed, but still not impossible. It can be absolutely proved or completely discredited only by a comparison of this particular reasoning process of the writer with the typical reasoning processes of other people. And such comparison implies, again, that knowledge of the laws of thought which we call logic.

If, then, the writer is enabled, by familiarity with the typical logical processes, not only to recognize what the train of thought has been which has brought him to a certain conclusion, but to determine whether or not it is so universal in character as to be reasonably certain in another mind to issue in the same conclusion, he is ready to set up his own train of thought in the mind of the reader. But just here a third difficulty may arise. Perhaps this train of reasoning, however clearly and exactly perceived, however normal and universal it may be, yet, because of some peculiar circumstances, refuses to be reproduced in the mind of the other person. Suppose, to take an extreme instance, the case in which a priest wishes to induce a criminal to confess his crime, that an innocent person falsely accused may go free. The priest believes that the criminal ought to do this on the general principle that one ought to do whatever will prevent injustice. But it is impossible to introduce into the mind of the criminal any chain of reasoning in which this principle

constitutes the first link. If the priest's only resource is to reproduce the train of thought which originally led him to the conclusion, his case is hopeless; for this train of thought refuses to enter the mind of the criminal, whose conclusion, that he ought to keep still about his crime, is founded upon the accepted principle that one ought to do whatever will save one's skin, or, more broadly, whatever it is for one's interest to do. Under such circumstances, the priest's course is perfectly plain. He must put himself imaginatively in the place of the person he addresses, and then come, by any way he logically can, to the conclusion he desires to establish. Perhaps he can do this by such a thought-process as the following: One ought to do whatever will be best for himself. It will be best for me to confess because the crime is likely to be discovered, and if it is, my sentence may be more severe than if I confess, and at any rate by confession I shall escape the greatest danger of all—that of going to hell ultimately. Having followed such a path of reasoning in imagination, the priest is able to reproduce it in the mind of the criminal and thus establish the conclusion.

We may say, then, that the best way to find a train of reasoning which, if set up in the reader's mind, will establish the conclusion desired by the writer, is for the writer to note carefully the train of reasoning which has led him previously, either in his own proper person, or imaginatively in that of another person, to this same conclusion; his observation of his own reasoning being tested and assured by a knowledge of the typical logical processes of other people.

The three divisions of the process of argumentation reflect themselves in our study of the subject. We shall learn first to examine our own reasoning processes with a

view to determining precisely what they are; second, to define and either confirm or correct these observations by a knowledge of the typical reasoning processes of other people; and, third, to reproduce in other minds our own trains of reasoning as thus determined.

EXERCISES.

1. Write a list of all the conclusions which you have tried recently to induce some one else to accept. Did you believe the conclusion yourself? What did you do to make your hearer believe it? Did you succeed in making him accept it? Do you know why you succeeded or why you failed? In case you did not succeed, do you think you could have done so by a different method?

2. Write a similar list of all the conclusions to which other people have recently tried to lead you. (Recall sermons and public addresses of any kind as well as private conversations.) Did you accept the conclusion in each case? If so, why? If not, why not? Would you have accepted it if the speaker had given you different reasons? Or if he had presented his reasons in a different order or form?

3. Of the three stages or divisions of the process of argumentation, which is the end and which are means? Distinguish the relative importance of the three as determined by their respective distances from the ultimate end, that of implanting the conclusion in the mind of another person.

4. Write an account, as exact in its details as you can make it, of the way in which you as a child came from your own experiences to believe any or all of the following facts:

(a) Dark corners are not dangerous. (Or, there is nothing to be afraid of in the dark.)

(b) All large children go to school.

(c) Flowers bloom in the spring.

(d) Cats scratch if you squeeze them hard.

(e) Everybody has to pay to ride on the railroad train (or street-car).

(f) Birds sing.

(g) Roses have a sweet smell.

CHAPTER II.

INDUCTIVE REASONING.

WE are in the habit of saying that children, and, in fact, that all of us "learn by experience." What do we mean by this saying? How does one learn "by experience"? What is the process involved?

The common meaning of this phrase is doubtless something like this. By successive experiments with certain objects, the child learns to generalize concerning them. He comes to see that some things which bear the same name or present a similar appearance, exhibit a certain common characteristic. Thus certain articles to which he has heard the word "china" applied, or which are associated in his mind by a similarity in appearance, are broken in his presence. Perhaps he himself has shattered a cup by letting it fall from his hands, or a number of dishes by pulling at the table-cloth, and thus throwing them to the floor. After this, he may also have seen the servant-maid break a pitcher by setting it down too heavily, and the cat smash several vases, knocking them off from the shelf to which she has sprung. As a result of these accumulated experiences, he is impelled to the conclusion that all dishes called china, or all dishes which have this peculiar glazed appearance, are likely to break if roughly handled. The child has learned by experience

that china is breakable. In much the same fashion he may be trusted to learn for himself that roses are prickly. A single experience of grasping a rose and having it prick the fingers might not be sufficient to induce this conclusion. This one rose was prickly, but it is not certain that others are. However, if a second rose, when grasped, lacerates the fingers as did the first, a tentative conclusion is apt to arise in the child's mind. Perhaps all bright flowers which look like these prick the fingers. And this conclusion is re-enforced by the third and the fourth experiments having the same result. Because four roses have pricked the child's hands, he concludes that all roses do so; because ten china dishes were seen to be breakable, that all china dishes may be broken.

Such a logical process as this is called inductive reasoning. The name may be explained with reference to its derivation, as signifying that several separate observations of certain individuals are brought to bear upon a single point—the determination of the class to which they belong. This, at any rate, may be regarded as the function of inductive reasoning, to build up a judgment concerning a class out of separate judgments concerning its various members.

This process of reasoning has become so much a matter of course with us that we find difficulty in analyzing it further. Of course we are entitled to say that Christmas comes in December, because all the Christmases we remember have done so, that babies cry when they are frightened, because every young child we ever knew had this habit, that all buttercups are yellow, because those we have seen were of that color. But if questioned sharply what right we have to conclude that all buttercups are yellow, simply because a few hundreds which we hap-

pen to have seen are so, we must own that the conclusion is by no means unquestionable. I have not seen all buttercups; and it is not impossible that some day I shall see a white or a blue one. I could not know with mathematical certainty that all buttercups are yellow until I had seen every buttercup in the world and found it yellow. It is absurd, however, to say that we are not sure all buttercups are yellow, in spite of the fact that we have not examined every one. We do believe this and we have a logical right to believe it—until we find a white buttercup or a blue one. But the possibility that we may find one makes this conclusion of ours a temporary, not an absolute, conclusion.

The absolute conclusion may be reached only in the case of a class all the members of which are accessible to examination. One can say “all my mother’s brothers have light hair and blue eyes,” with absolute certainty of the truth of the statement, for every member of the class “my mother’s brothers” has been accounted for. It needs no logical process to enumerate them and declare that all of them, without exception, have blonde coloring. This is absolute certitude, and differs essentially, as we shall see, from logical certitude.

The conclusions which we have heretofore considered involve this logical certitude, which is of necessity relative and temporary. All clergymen of the English Church wear vestments while conducting services, is a conclusion of this sort. We do not know all clergymen of the English Church; neither ourselves nor our friends have been able to observe that more than a hundred or so wear vestments while conducting the service, but we are nevertheless fully persuaded in our own minds that this is the habitual practice of all clergymen of the English Church.

We return, then, to our question, as yet unanswered—whence comes our right to this conclusion?

It is evident that something lies back of this reasoning process to justify it, a principle too self-evident to be spoken of under ordinary circumstances. When we find a certain characteristic in several members of a class, we consider ourselves entitled to suppose its existence in all the other members of that same class, though we have not examined each of them separately. When we see that the leaves on one side of a tree are five-pointed, fine-textured, and pale green, we expect those on the other side to have these same characteristics. If we know that some chestnut burs are brown and spiny, we cannot imagine finding others smooth and pink.

From this tacit expectation arises the principle* taken for granted whenever we reason inductively: *What is true of several members of a class is true of the class as a whole.* Starting with this assumption, we are enabled to reason as follows. Since whatever is true of several members of a class is true of the class as a whole, if I find it true of several buttercups that they are yellow, I can conclude that buttercups as a class are yellow. If all the Episcopal clergymen I know wear vestments in conducting church services, all Episcopal clergymen may be judged to do so.

It is possible, then, to analyze any reasoning process of this sort into three stages as follows:

I. Assumption. What is true of several members of a class is true of the class as a whole.

II. Facts.

1. This rose is prickly.

2. The rose I had yesterday was prickly.

* Sometimes called the principle of the uniformity of nature.

3. The rose I picked two days ago was prickly,
etc.

III. Conclusion: All roses are prickly.

Before we consider separately each of these stages, it will be well to notice one characteristic common to them all. This is the fact that each of them is represented by a proposition. By this is meant that each of the foregoing statements is a complete declaration about something. It is not a mere name or a mere phrase, such as "roses," or "prickly roses," or even "the stems of roses," or "the rose I had yesterday," but "This rose has a prickly stem," or "Roses have prickly stems." Every stage in a process of inductive reasoning is expressed by a proposition, a complete statement.

Let us consider first the assumption. This itself is, ultimately, the conclusion of an inductive argument. People have noted that, in several cases, what they have observed to be true of certain members of a class has turned out to be true of all the other members of that class when they have been also examined. Hence they have adopted, as a working hypothesis, the proposition that what is true of several members of a class is true of the class as a whole.

The phrase "working hypothesis" should here be emphasized. The inductive assumption is but a rough-and-ready approximation. We have heretofore considered it only in its most general form, "What is true of several members of a class is true of the whole class," the word "several" being quite undefined. We do not know whether "several" means two or ten or fifty or six thousand, and we cannot know as long as the statement covers all cases of induction. The assumption cannot be at once definite and inclusive. In the general form which

lies back of all induction, it is only a half-formulated presupposition, deeply rooted in the human consciousness, but essentially vague and for the most part unrecognized. We are all sure that members of the same class are somehow alike, else why should they constitute a class? The notion of resemblance is involved in our very idea of a class. We regard things as belonging to the same class just because of some likeness in appearance or function. Then what is more natural than to take a few of these things as representative of the rest and draw our conclusions as to the rest from the few we see? This is the common notion, the undefined assumption, which seldom, in practical experience, gets so far as to question, "How many members does it take truly to represent a class?" This is an inquiry which belongs to the scientific applications of induction. For practical purposes we seldom do more than to recognize dimly that in a given case we did or did not examine a sufficient number of members to justify our drawing conclusions as to the whole class. Our general assumption remains still undisturbed and undefined, that a certain number of cases, not too few of course, does serve as the basis for a conclusion regarding all cases of the same sort.

So much for the general form of the inductive assumption. Its particular form varies with the specific case. If one concludes from observation of two doctors who always carry in their pockets candy for the children, that all doctors have this benevolent habit, the assumption is plainly that what is true of two members of a class is true of the class as a whole. If, on the other hand, the conclusion that serge wears well is drawn from five different pieces of serge, all of which had a long and honorable record of service, the reasoning evidently presupposes that

what has been found true of five members of this class is true of the class as a whole.

The particular assumption for any given inductive argument is determined, then, by the number of facts supporting the conclusion. What this number shall be we must now inquire.

We must recognize at the outset that the number of facts which suffice to establish an inductive conclusion is almost infinitely variable. In the cruder, less conscious forms of this reasoning one instance alone, if it make a sufficiently vivid impression upon the mind, is often responsible for a conclusion about the entire class represented. A case of such slenderly supported reasoning is the induction upon which rested Tom Tulliver's "half-admitted fear" of the humpbacked Philip Wakem "as probably a spiteful fellow, who, not being able to fight you, had cunning ways of doing you a mischief by the sly." * The genesis of this opinion concerning Philip is suggested by the author in the following statement: "There was a humpbacked tailor in the neighborhood of Mr. Jacobs' academy who was considered a very unamiable character, and was much hooted after by public-spirited boys solely on the ground of his unsatisfactory moral qualities, so that Tom was not without a basis of fact to go upon." * One humpbacked person is a vicious character, therefore all humpbacked persons are vicious characters, Master Tom would argue. And in like manner do even older and wiser people than he occasionally judge an entire class from a single one of its members.

But when such wide conclusions from narrow data come to be overthrown, as they are likely to be by the obser-

* *Mill on the Floss*, Bk. III., ch. II.

vation of other instances opposing the one previously noted, one is apt to say to himself,—The trouble was, I hadn't seen enough members of the class to represent it fairly. I had no business to judge the whole class from one member of it. And the question at once obtrudes itself—How many members of a class must be observed in order to justify a conclusion concerning the class?

This question may be answered at once by saying that an inductive conclusion which is built upon but one observation is as justifiable as one supported by a hundred facts; the only difference between the two is that the first is less likely than the second to be permanent. So long as Tom had seen no amiable humpbacks he was logically entitled to construct his idea of the class from the one unamiable member of it that he knew. The fact that his acquaintance with the class was so limited, however, made his conclusion concerning it extremely likely to be overthrown by further observations. The question is, then, not how many facts justify coming to an inductive conclusion, but how many are likely to insure its permanency in one's mind?

It is evident that a conclusion in regard to a class of things is likely to stand if it is based upon experience with a representative number of that class. But what is a representative number? Doubtless this would vary with the nature of the class. It might seem at first thought that the size of the class would be an important factor in this problem. Where there are few members in the class, as when one ventures a generalization about women's colleges in America, it would appear that a smaller absolute number of members need be examined than in the case of a conclusion about, say, ministers' children. Yet the real reason for the larger number of observations in the

case of ministers' children can hardly be the greater size of the class, for the same number of specific facts as would be required to establish the conclusion regarding the small class of women's colleges in America would be ample for a conclusion concerning the large class of red-winged blackbirds. In such a case as this last, although the size of the class is unquestionable, the chances of uniformity throughout the class are more than correspondingly great. The class lacks the complexity and therefore the opportunity for variations characteristic of such a class as that of women's colleges in America, or, still more, that of ministers' children. In the one case the points of similarity between the members are many and the points of unlikeness few. The homogeneity of the class is conspicuous. In the case of women's colleges, however, or still more in that of ministers' children, the unity of the class is not more marked than the diversities within it. It is a loosely amalgamated group, united perhaps at a single point.

In considering, then, how many individuals in a class must be examined in order to insure to the conclusion at least a relative permanency, the homogeneity of the class must be noted. Roughly speaking, the number of observations to be made under each class should vary inversely with the homogeneity of the class.

But of course it is impossible, except in comparatively sophisticated induction, to apply this test of the permanency of the conclusion. We cannot know the degree of homogeneity characteristic of any given class until we have already come to several inductive conclusions about it. We cannot, for instance, tell how closely knit the class china dishes may be, so long as it is to us only table utensils with a certain non-metallic, glazed appearance. We

must discover by induction that all china dishes are breakable, that they are made of clay and baked in a kiln, before we can know just how homogeneous the class is. Having determined, however, the degree of homogeneity possessed by any class, we may use this determination as a basis for deciding what proportion of its members must be examined in order to establish with some permanency a further conclusion regarding the class.

The exact form taken by the facts which support an inductive conclusion should be carefully noted. Each fact may be described as a statement that an individual member of some class has a certain characteristic, or, more broadly, that it belongs to the large class of things having this characteristic.* It is thus precisely correlative in form with the conclusion, which states that the entire class has a certain characteristic, or, more broadly, that it is included in the larger class of things having this characteristic.

The conclusion of inductive reasoning must not be regarded as necessarily permanent or as literally true. "All children are innocent," we say, yet there may be exceptions to this rule. What we mean is not absolutely that every child is innocent, but that as a class children are innocent. And, again, our conclusion that "All doctors carry candy in their pockets," though steadfastly believed so long as we are acquainted with no doctor who does not carry candy in his pockets, is at once overthrown when we learn of several doctors who have not this delightful habit. We must accustom ourselves to look upon our inductive conclusions and those of other people, not as finalities but only as tentative judgments, very likely to be

* The student should be required to reduce to this typical form each fact used to support any inductive conclusion.

revised after further experience, yet useful so long as they stand. The process by which such conclusions are revised will be discussed in the following chapter.*

EXERCISES.

1. Take down from the conversations you hear before the next recitation several conclusions of the sort discussed in this lesson. Trace out the train of reasoning which you imagine must have led to them, setting it down under the three heads, (I.) Assumption, (II.) Facts, and (III.) Conclusion.

2. Note in writing all the generalizations you make during a given week, and set down precisely the facts upon which each is based.

3. Analyze, as in Exercise 1, the reasoning processes of which the following propositions are the conclusions:

(a) The youngest children in a family are always spoiled.

(b) Bulls are enraged at the sight of red.

(c) Blessings brighten as they take their flight.

(d) All superstitious people are ignorant.

(e) College girls have bad manners.

(f) Children in fiction are unnatural.

(g) All people fear that from which they have once received injury.

(h) Poets have no business ability.

(i) Rich men in America are patrons of educational institutions.

(j) The heroine of the old-fashioned novel has no mother.

(k) The lame and the lazy are provided for.

* For supplementary illustrations of the process of inductive reasoning, see Appendix A.

(*l*) Where there's a will, there's a way. ,

(*m*) All self-made men are egotists.

(*n*) The little vermin race are ever treacherous, cruel, and cowardly, whilst those [creatures] endowed with strength and power are generous, brave, and gentle. Goldsmith: *Vicar of Wakefield*.

4. How many facts are necessary to establish each conclusion in Exercise 3? How many to establish each conclusion so that it is not likely to be overthrown?

5. Trace the reasoning process involved in Maggie's conclusion as represented in the following statement. Analyze the processes which have led you to similar conclusions.

She [Maggie] could have informed you that there was **such** a word as 'polygamy,' and being also acquainted with 'polysyllable,' she had deduced* the conclusion that 'poly' meant many. George Eliot: *Mill on the Floss*.

6. Has each of the following conclusions absolute or only logical, and hence relative, certitude? If to you it has only logical certitude, could it have absolute or mathematical certitude to some one else?

(*a*) All George Eliot's novels are interesting (or uninteresting).

(*b*) All industrious people are successful.

(*c*) All mice eat cheese.

(*d*) The sons of great men are always inferior to their fathers.

(*e*) All presidents of the United States are men of upright character.

(*f*) Canadian roads are good for cycling.

(*g*) All women's colleges in America require four years' study for graduation.

* Is "deduced" the proper term here?

7. If you wished to make some one else believe one of the conclusions stated in Exercise 3, how would you set about doing so? Write a letter to some one of your friends inducing him to accept any one of these conclusions.

8. Suppose your friend, from his own experience, has come to believe just the opposite of your conclusion. Let us say that he has noticed that college girls have good manners, or that rich men in America use their money for themselves alone. Can you induce him to believe that college girls have bad manners, or that rich men in America give largely to educational institutions? How can you do so?

9. Supply the necessary conclusion for each of the following sets of facts, and then analyze each piece of reasoning according to the form suggested in Exercise 1.

(a) Alexander the Great had conquered Greece at twenty-one, Persia at twenty-five. . . . Sulla is on record as having detected the capacity of Julius Cæsar at the age of seventeen. When twenty-nine, Hannibal crossed the Alps with his victorious army, and two years later won the greatest victory of his life. . . . Before he was thirty, Oliver Cromwell was a member of the parliament which passed the famous Petition of Right. . . . Napoleon was master of Italy at twenty-five, the arbiter of Europe at thirty-five. . . . Wellington was an ensign at eighteen, a major at twenty-four, a distinguished colonel at twenty-five. Halleck: *Education of the Central Nervous System*, pp. 102-3.

(b) [Chaucer], . . . although . . . born in London, . . . spent a part of his youth in the country. . . . [Shakespeare's] . . . youth was passed amid the finest rural scenery in England. . . . John Milton was born in

London, but he was fortunate enough to have five years of pure country environment at the time he was entering on full manhood. . . . Sir Walter Scott was born in Edinburgh, but spent a part of his boyhood on a farm at Sandyknowe, which was situated amid romantic scenery. . . . William Wordsworth was born in a small town in Cumberland, and he passed the most of his boyhood as well as of his later life in the wonderful Lake District. Halleck: *Education of the Central Nervous System*, pp. 84-88.

(c) It comes with a shock to many who are familiar with Matthew Arnold's exquisite and scholarly work, to learn that all his life long, while he was editing Wordsworth and writing classic poems and stirring the thought of his times with "Literature and Dogma," he was earning his bread by going about England at the miserable drudgery of examining school children. Oliver Wendell Holmes was an enthusiastic physician, and quite as famous in the world of medicine for his contributions to that science, as in the world of letters for his "Autocrat" or "Elsie Venner." Among writers whose names are at present on men's tongues, Edmund Clarence Stedman is a banker, James Lane Allen is a lawyer, Henry Van Dyke is a clergyman, Louise Imogen Guiney is a post-mistress, John Vance Cheney is a librarian, and so on to the end of the list. . . .

Literature as a livelihood, usually, though not always, means something besides writing. The "something" may mean lecturing, like Mark Twain and so many others, that one does not know where to begin or end the list of those who, having thrown themselves wholly upon letters as a profession, hasten to help out its yield by the aid of lecturing or reading from their previously published work.

Editing is the mainstay of a very large proportion of those who own literature as a profession. Charles Dudley Warner fills a double editorial capacity, on his own paper in Hartford, and on *Harper's Magazine*. John Kendrick Bangs finds editing a material help to humor, Margaret E. Sangster depends on editing for a livelihood, Robert Bridges is an editor on one magazine and a critic on two others; George W. Cable edits a magazine, and Richard Harding Davis has found editorial connections very agreeable even in his meteoric career. I might multiply this list, for it is a long one. Lowell and Bryant were editors, Bryant on a daily, that meanest of drudgery. Whittier was an editor, what part of his life physical suffering would permit any occupation. Dickens and Thackeray were both hard-working editors, and the list of British writers of the present day whose livelihood is first editing, then writing, is extensive. *Self-Culture*, July 1897.

10. Are you quite certain that the conclusion you have supplied is in each case the necessary and the only necessary conclusion from the facts? Have you in mind any other facts which tend either to confirm or to oppose the conclusion?

11. Use the facts given in each instance, together with any others which you know or can find, to convince some one else * of the truth of the conclusion. If he chances to believe a conclusion directly contrary to this, how can you induce him to accept yours?

12. Write down at least six proverbs which rest upon a process of induction, and analyze the reasoning completely.

13. Name several popular superstitions which have an

* The teacher should define the reader or have the student do so whenever he writes.

inductive basis. Why do certain people believe them? Why do you discredit them?

14. State several scientific laws which seem to you to be conclusions drawn from inductive reasoning,* and analyze the reasoning.

15. What is the essential difference between the inductive conclusions of science and those of superstition?

16. Note instances in which (*a*) the physician, (*b*) the farmer, (*c*) the student in the laboratory,† and (*d*) one who learns a new language, must reason inductively.

17. Write out a clear statement of what you imagine would happen if we were unable to reason inductively. Consider several concrete cases in which the inability to generalize might lead to awkward or even serious results, and discuss these results fully.

* The student should be required to take these laws from as many different fields as possible; from physics, chemistry, biology, geology, or from any other sciences which he has studied.

† Any laboratory with which the student is familiar may be specified.

CHAPTER III.

INDUCTIVE ARGUMENT.

WHEN one has carried on a reasoning process such as that discussed in the foregoing chapters, and come to a certain conclusion about a class of things, he **often** has occasion to transfer this conclusion to the mind of some other person. He may wish, let us say, to make some one else believe, as he does, that college men are generally successful in business. In order to introduce this conclusion into the mind of another person, he will, it is certain, need to begin with a train of reasoning which logically leads to the conclusion. Such a train of reasoning has already passed through his own mind, leaving behind it this conclusion which he wishes to induce another person to accept. He therefore notes carefully what this train of reasoning has been, with a view to securing its entrance into the mind of his auditor.

Let us say that our believer in the success of college men in business has come to this faith through knowledge of several collegians whose financial success was marked. "All the men in my class," he says to himself, "who went into business, made a good thing of it. Some did better than others, of course, but nobody has failed to make a handsome living. Then there is my father, and his partner, and both my uncles, and Grant, and Tobey, and

Rolf, and Stevens, and Van Tassel—all of them are college men who have made fortunes in business.”

This being the course of reasoning which has brought him to the conclusion that college men are successful in business, he naturally attempts to start this same course of reasoning in the mind of the friend whom he would induce to his belief. Accordingly he cites each of these instances of a college man's success in business, one after another, certain that if each fact be accepted by the hearer, the conclusion must obtain lodgment in his mind.

It may be, however, that in seeking to establish this conclusion in his friend's mind, he will not be content with the simple enumeration of the facts which have determined his own belief. These may have been very few in number, but successful in establishing the conclusion to his own satisfaction, either because uncontradicted by any opposing facts, or because in themselves peculiarly conspicuous. But he will not rely upon these few facts, although so effective in his own case, to accomplish the same conviction in the case of his hearer. To the hearer they may seem far less cogent, lacking, perhaps, the flavor of personal, first-hand knowledge; in which case the speaker must either increase very largely his number of supporting instances or furnish some from the common acquaintance of speaker and auditor. Then, too, it may be that the hearer is acquainted with certain collegians whose inefficiency in business matters is notorious. This case, however, demands a separate treatment.

It seems a matter of small difficulty to introduce an inductive conclusion into the mind of another person by citing the particular facts which have given rise to it, provided no opposing facts lurk in the consciousness of the other person. But when the entrance of the conclusion

is resisted by an antagonistic conclusion, drawn from facts in the hearer's own experience or observation, the problem becomes doubly complicated. In this case the first necessity is plainly to uproot the opposing conclusion. How this is done we shall see if we inquire how any inductive conclusion is displaced from our own minds, after it has once obtained a foothold there.

We have repeatedly noticed in our own experience the overthrow of generalizations once implicitly credited. As children we believed that all dogs were ferocious beasts, because one had bitten a playmate; that all stepmothers were harsh and cruel, because one in a story was so; that all girls named Florence had blue eyes and yellow hair, because the only two Florences known to us happened to be of the blonde type. But we discarded these conclusions after a while, without argument. How did we come to do so?

To start with a fresh instance, let us suppose a fifteen-year-old girl to have read *Emma* and *Mansfield Park*, and become convinced thereby that Jane Austen's novels are essentially stupid reading. There are only two ways in which such a conclusion is likely to be dislodged from her mind. She reads no more of Jane Austen for some time. Then, after several years, let us say, she may chance to hear *Emma* praised by some person for whose judgment she has respect. She rereads the book, and now likes it heartily. The previous conclusion, that all Jane Austen's books are stupid reading, totters a little. Perhaps she was mistaken. She rereads the second book, also with pleasure, and the previous conclusion utterly falls. The facts which had supported it have been disproved, and the conclusion is accordingly overthrown. At the same time a new set of facts has come to light in the rereading of the

two once-condemned books. Each of these books may now be pronounced delightful, and the eagerness with which the late scoffer begins to read the other novels of Jane Austen betrays her half-conscious expectation that all this author's novels are like the two she has reread, that is, delightful.

In this one way, then, is an inductive conclusion often discredited. But there is also another possible road to the same goal. Perhaps the books from which the original conclusion has been drawn are not re-examined. The verdict upon them remains the same. But some friend highly recommends *Pride and Prejudice*, which turns out to be so delightful that *Sense and Sensibility* is attempted, with like result. Now indeed is the universality of the earlier conclusion invalidated, but that is all. It is certain that not all Jane Austen's novels are tiresome, for two of them have proved most interesting. Yet neither are they all delightful. The first conclusion has been partially discredited, but no antagonistic conclusion has superseded it, to make its rout complete. It is not possible, from the data at hand, to come to any conclusion whatsoever concerning the whole class of Jane Austen's novels. The mind can only hover between the two conclusions, that Jane Austen's novels are tiresome and that they are interesting. It is, however, almost inevitable that the later conclusion, simply because it is more recent and hence more vivid, should tip the balance somewhat, and the reader betake herself to another unread novel of Jane Austen. In case this proved to be delightful, one can imagine the reader's making some such remark as this: "I like Jane Austen's novels; that is, all but the two I read when I was little more than a child. They seemed very stupid to me then, but my taste has probably changed.

and I might be extremely fond of them now. At any rate I am going to read them again and see." The second conclusion, that Jane Austen's novels are interesting, has by this time become so strong that the facts which oppose it are regarded as questionable; and whether, upon investigation, they prove true or not, they will in any event be regarded as exceptional, the conclusion standing in spite of them.

These two ways there are, then, in which such a conclusion as that Jane Austen's novels are stupid is likely to be overthrown by experience. And these are the two ways, therefore, which are open to one who wishes to displace a similar conclusion by means of argument. One, which may be called the direct way, is by simply disproving the facts on which the conclusion rests. In doing this new facts will inevitably arise which issue in a contrary conclusion, tending to supplant the original generalization. The other way is more indirect. The old conclusion is not openly attacked, but other facts are brought forward which compel a new generalization, exactly antagonistic to the old. The two conclusions cannot stand together in the same mind, hence it becomes necessary to get rid of one, either by disproving its facts, as in direct refutation, or by setting it aside, its facts being allowed to stand, but regarded as exceptional, and therefore not affecting the rule. The conclusion which is set aside, in this case, is of course altogether likely to be the one supported by the fewest or by the most disputable facts.

Let us trace out in detail these two methods of overthrowing a given conclusion in the mind of another person. Suppose the following to be the argument for attack.

"There's no doubt that great writers have irritable tem-

pers. Take Byron, for instance; think how he quarreled with his wife. And Carlyle—he was a regular old curmudgeon. Then Johnson, you know, spoke civilly to nobody when he was in one of his tempers. And Tennyson was rude to every sightseer who ventured on his grounds.”

The direct means of overthrow is not difficult here. One can readily imagine such a counter-argument as the following :

“ No one of these men cited had a temper that was really irritable. Byron was high-spirited, indeed, but not ill-tempered. The quarrels with his wife are believed by many people to have been almost wholly due to her. And Carlyle, while he had the crusty Scotch way with him, was one of the kindest-hearted men in the world. Johnson’s manners were rough, but not more so than those of his age. He rebuked pretension and ignorance, but always without petty irritation. And as for Tennyson, he treated prowling sightseers as the most complaisant man would do who found them repeatedly in his private grounds where they had no business to be, and where they had been expressly forbidden to go.”

If the statements here made be accepted, it is not possible, from the facts alleged in the given argument, to conclude that great writers have irritable tempers. These facts have been, one by one, disproved. Byron did not have an irritable temper, nor did Carlyle, nor Johnson, nor Tennyson. They may sometimes have seemed ill-tempered, but they were really as good-natured as other men. These particular instances, then, do not prove that great writers have irritable tempers. The conclusion is overthrown.

But as long as no contradictory conclusion takes its

place, there must remain a lingering doubt whether, after all, the first generalization may not be true. If these particular facts do not prove it, there may be others which do so. The doubt cannot be removed but by the establishment of the directly contradictory conclusion that great writers have genial and equable tempers. In other words, the indirect method of disproof is called upon to supplement the direct.

The indirect method requires, as has been said, the citation of new facts leading to a conclusion antagonistic to that already reached. In the case which we have considered, such facts as the following might be alleged: "Bacon had an equable temper, as did Addison, Scott, Wordsworth, and Browning. Goldsmith and Charles Lamb were notably of sunny dispositions; Burns and Moore were careless, good-natured, easy-going chaps; Dickens, Thackeray, and our own Holmes, well-springs of geniality."

Such facts as these make for the conclusion that great writers are good-tempered people, which is plainly incompatible with the conclusion that great writers have irritable tempers. One of these conclusions must go. Which is to yield depends largely upon the number of facts cited in support of each conclusion. Other things being equal, an overwhelming number of facts making for the conclusion, "Great writers are good-tempered people," would tend to establish that in the face of a few facts leading to the opposite conclusion. In this case the latter facts will inevitably be questioned, or if allowed to stand, will be regarded, like yellow raspberries or blue carnations, as exceptions to the general rule.

The disproof, or the refutation, as it is more commonly called, of an inductive argument, may then be accom-

plished either directly, by overthrowing the facts upon which the conclusion rests, or indirectly, by establishing a contradictory conclusion so indisputably that the previous conclusion must yield to it. Neither of these methods is completely satisfactory without the other; but together they effect the complete displacement of an inductive conclusion.

EXERCISES.

1. Write a short argument inducing the person named in each case to accept any one of the following conclusions. Before writing the argument, set down, in this order, the particular assumption, the facts you mean to use, and the conclusion. If, when you have finished the argument, you find you have in any way deviated from your plan, as by using more facts or different ones, add a second skeleton of the argument, representing it as you actually wrote it.

(a) Great cities are located on large bodies of water. (To an inhabitant of Squedunk, who boasts that that inland town will become the metropolis of the state.)

(b) Literary men make unhappy marriages. (To a friend who has never noticed that fact.)

(c) Haste makes waste. (To a companion who exhorts you to hurry, when you are not disposed to do so.)

(d) People don't give something for nothing. (To an old farmer inclined to invest in a gold brick.)

(e) Men's judgments become more generous as they grow older. (To a young man or woman who expects always to maintain the present severity of his judgments of other people.)

(f) All magazine stories are a mass of affected conver-

sation with no plot-interest. (To a friend who recommends one you have not read.)

(*g*) Men can do whatever they will to do. (To a person of great natural ability but no ambition.)

(*h*) First impressions are untrustworthy. (To an acquaintance who dislikes a friend of yours at first sight.)

(*i*) People's lives are determined by circumstances over which they have no control. (To a friend who blames a criminal or a ne'er-do-well for his unprofitable life.)

(*j*) Authors reveal their characters in their writings. (To one who believes the character of a certain author to be inconsistent with the spirit of his writings.)

(*k*) Failures are the foundations of success. (To one who feels chagrined and humiliated over his failure in a certain undertaking.)

(*l*) Kindness wins kindness. (To some one who complains that there is little friendly consideration in the world.)

(*m*) All perfect art seems simple. (To one who objects to Wordsworth's *Lucy* because it is so simple.)

2. Having exchanged themes with some member of the class who has written upon another subject than the one you chose, take the point of view of the person to whom his argument is addressed, analyze the argument carefully, disprove the facts alleged in support of the conclusion, or cite a larger number of other facts leading to the contrary conclusion, or use both these methods of refutation.

3. Analyze the following arguments, supplying the conclusion when necessary, and, if possible, refute each thoroughly, stating at the close the method used.

(*a*) All the most illustrious Germans of the latter half century have been long-lived. William I. was ninety-one at the time of his death; Moltke was also ninety-one, and

Bismarck was eighty-three. Ranke was ninety-one, Curtius seventy-two; Mommsen is eighty-one. The poet Geibel was seventy, Wagner seventy, and Liszt seventy-five.

(*b*) A large number of great musicians lived to be old men. Those who died between sixty and seventy years of age include Bach, Von Bülow, and Rubinstein. Living beyond seventy years came Glück, Gounod, Handel, Liszt, Meyerbeer, Rossini, Spontini, and Wagner, while the great age of eighty-nine was attained by Auber and others. Dying at more than eighty were Cherubini, Cramer, Lachner, Palestrina, Rameau, Schutz, and Taubert.

(*c*) Sheridan, one of the greatest of British orators, who entered Parliament after a conspicuously successful literary career, so nearly broke down in his maiden effort, that the general verdict pronounced upon him was "Nature never intended him for an orator."

Brougham and Canning were equally unsuccessful, and many of the most celebrated speakers of the present day displayed no signs of oratory when they appeared for the first time before the critical assembly at St. Stephen's.

Mr. Gladstone's maiden speech, delivered February 21, 1833, was a nervous, hesitant, and almost inaudible effort.

(*d*) Julius Cæsar was assassinated when he had almost completed the task of consolidating the administration and dominion of the Roman Empire, and his death opened the way to that despotism and corruption which ultimately undid his work. Henry of Navarre was killed when he had almost healed the differences between Catholic and Protestant, which subsequently rent not only France, but Europe; and William the Silent also fell when he was on the point of uniting the Netherland provinces into a compact barrier against the encroachments of Spain.

In English history Lord Clive died at the moment when he was the one man who could have saved the American colonies and kept the Anglo-Saxon race united. And there is the case of Mirabeau; he was literally the one man in France who could have averted the horrors of the Revolution, saved and reformed the monarchy, and so spared Europe the murderous career of Napoleon and all the devastation it brought. If he had lived ten, or even five years longer, the history not only of France, but of Europe and the world, would have been different. It is, in fact, sufficient to say that he would have made both Robespierre and Napoleon impossible.

(e) Note broadly in the outset, Shaksperè has no heroes—he has only heroines. There is not one entirely heroic figure in all his plays, except the slight sketch of Henry the Fifth, exaggerated for the purposes of the stage, and the still slighter Valentine in the *Two Gentlemen of Verona*. In his labored and perfect plays you have no hero. Othello would have been one, if his simplicity had not been so great as to leave him the prey of every base practice round him; but he is the only example even approximating to the heroic type. Coriolanus, Cæsar, Antony, stand in flawed strength, and fall by their vanities; Hamlet is indolent, and drowsily speculative; Romeo, an impatient boy; the Merchant of Venice, languidly submissive to adverse fortune; Kent, in *King Lear*, is entirely noble at heart, but too rough and unpolished to be of true use at the critical time, and he sinks into the office of a servant only. Orlando, no less noble, is yet the despairing toy of chance, followed, comforted, saved, by Rosalind. Whereas there is hardly a play that has not a perfect woman in it, steadfast in grave hope and errorless purpose; Cordelia, Desdemona, Isabella, Hermi-

one, Imogen, Queen Katherine, Perdita, Sylvia, Viola, Rosalind, Helena, and last, and perhaps loveliest, Virgilia, are all faultless, conceived in the highest heroic type of humanity.

Then observe, secondly:

The catastrophe of every play is caused always by the folly or fault of a man ; the redemption, if there be any, is by the wisdom and virtue of a woman, and, failing that, there is none. The catastrophe of King Lear is owing to his own want of judgment, his impatient vanity, his misunderstanding of his children ; the virtue of his one true daughter would have saved him from all the injuries of the others, unless he had cast her away from him ; as it is, she all but saves him.

Of Othello I need not trace the tale, nor the one weakness of his so mighty love ; nor the inferiority of his perceptive intellect to that even of the second woman character in the play, the Emilia who dies in wild testimony against his error—" Oh, murderous coxcomb ! What should such a fool do with so good a wife ? "

In *Romeo and Juliet*, the wise and entirely brave stratagem of the wife is brought to ruinous issue by the reckless impatience of her husband. In *Winter's Tale*, and in *Cymbeline*, the happiness and existence of two princely households, lost through long years, and imperiled to the death by the folly and obstinacy of the husbands, are redeemed at last by the queenly patience and wisdom of the wives. In *Measure for Measure*, the injustice of the judges, and the corrupt cowardice of the brother, are opposed to the victorious truth and adamant purity of a woman. In *Coriolanus*, the mother's counsel, acted upon in time, would have saved her son from all evil ; his momentary forgetfulness of it is his ruin. Her prayer at last

granted, saves him—not, indeed, from death, but from the curse of living as the destroyer of his country.

And what shall I say of Julia, constant against the fickleness of a lover who is a mere wicked child? of Helena, against the petulance and insult of a careless youth? of the patience of Hero, the passion of Beatrice, and the calmly devoted wisdom of the “unlessoned girl,” who appears among the helplessness, the blindness, and the vindictive passions of men, as a gentle angel, to save merely by her presence, and defeat the worst intensities of crime by her smile?—Ruskin: *Sesame and Lilies*.

(f) A proper heroine has neither father nor mother alive. She is thrown on her own resources and does her skirmishing or fighting single-handed. There may be a brother to back her up, but he generally is an insignificant personage, and rather in the way than otherwise. Some one writes that from time immemorial the heroine of fiction “is a noble, high-spirited, and motherless girl.” Pray you, look at Shakespeare’s young women. The motherless ones are Viola, Miranda, Desdemona, Rosalind, Imogen, Ophelia, Helena, Perdita; and where is the mamma of King Lear’s daughters? Juliet has a mother, but as a writer in *Notes and Queries* intimates, the daughter of the Capulets must have been a young person fairly precocious, rather hard to manage—for it is Juliet’s nurse who sways the fair girl’s destinies rather than her mother. The mothers in fiction are decidedly incumbrances, and as to mothers-in-law, the novel maker regards them as obstructive.

(g) The recent death of the Hon. T. J. Byrnes, Premier of Queensland, at the early age of thirty-eight, draws attention to the remarkable number of young men who

reach high places at an age when in more deliberate epochs a man had scarcely settled down to his career.

Although William Pitt, the boy premier, has no rival, even in these days of rapid careers, there are hundreds who achieve fame and position within twenty years of leaving their books at school or college.

Mr. Cecil Rhodes was Treasurer General of Cape Colony at thirty-one and premier at thirty-seven, and Sir Alfred Milner, one of the most brilliant of younger Englishmen, was Chairman of the Board of Inland Revenue at thirty-eight, and at a few years over forty holds one of the most responsible posts in our empire.

The new viceroy of 280,000,000 in India was a minister of the crown at thirty-two. Mr. Asquith, in spite of his brilliant gifts, started the race for fame slowly; still he was a queen's counsel at thirty-eight, and reached high cabinet rank at forty.

Lord Rosebery owes little to his rank that he was in the ministry at thirty-four, and prime minister at forty-seven; and Mr. Arnold Morley, still on the hopeful side of fifty, was chief Liberal whip and Secretary to the Treasury at thirty-seven.

Among artists there are many men who have made themselves famous in the "thirties." Mr. Alfred Gilbert, the Queen's favorite sculptor, became an A.R.A. at thirty-three, and a full-blown Academician five years later. Professor Herkomer was an associate at thirty and an Academician at forty-one.

Mr. Solomon Solomon painted his magnificent picture, "Cassandra," at twenty-six; Mr. Onslow Ford, R.A., leaped into fame at about the same age; Luke Fildes painted his grand and pathetic "Casual Ward" at thirty; Mr. Frank Dicksee became an R.A. at thirty-eight, thus

equaling Mr. Alfred Gilbert's and Mr. Hamo Thornycroft's records.

In music, Pietro Mascagni was twenty-seven when he woke to find that his *Cavalleria* had made him famous ; Mr. Hamish McCunn, the clever young Scotch composer of over one hundred songs and operas, overtures and cantatas without number, is still a young man of thirty, and Sir Arthur Sullivan did some of his best work while in the twenties.

Marconi, the inventor of wireless telegraphy, is only twenty-three, and Edison was little more than a boy when his name was first known in two continents.

But it is in the field of letters that youth claims the richest harvest. It is the "Paradise of Youth," and a man who is not crowned before he enters the thirties is in danger of going uncrowned for the rest of his life.

Mr. Anstey (Guthrie) was twenty-six when he wrote *Vice Versa* ; Mr. Jerome was three years older when *Three Men in a Boat* appeared. Mr. Barrie was twenty-eight when *Auld Licht Idylls* pointed the way to fortune. Mr. Rider Haggard wrote *King Solomon's Mines* at thirty.

Mr. Rudyard Kipling was barely of age when he wrote *Departmental Ditties*, and his *Plain Tales from the Hills* appeared at twenty-two. Mr. Israel Zangwill did his best work, in the *Children of the Ghetto*, when he was twenty-eight. Mr. H. G. Wells wrote the *Time Machine*, the pioneer of his popular novels, when he was twenty-nine. Mr. Crockett was three years over the thirty limit when *The Stickit Minister* inspired him to try fiction.

Mr. Quiller Couch wrote *Dead Man's Rock* at twenty-four, and Mr. Morley Roberts had been through a world of adventures before he closed his "twenties."

London Daily Mail.

X (h) An institution is the lengthened shadow of one man ; as, Monachism, of the Hermit Antony ; the Reformation, of Luther ; Quakerism, of Fox ; Methodism, of Wesley ; Abolition, of Clarkson.—Emerson : *Essays, First Series, Self-Reliance*.

X (i) Pythagoras was misunderstood, and Socrates, and Jesus, and Luther, and Copernicus, and Galileo, and Newton, and every pure and wise spirit that ever took flesh. To be great is to be misunderstood.—Emerson : *Essays, First Series, Self-Reliance*.

(j) A stage whisper following a loud tone, a sour taste succeeding a sweet one, the charm of the country to a city child, the buds and blossoms of spring when they first clothe the barren branches, claim a special hold on the attention. Often we do not notice the foul air in a room where we have long been sitting ; but some one coming in from the fresh out-of-doors immediately opens a window. Gentle speech and refined surroundings seem to us a matter of course until we have been jarred by uncouth accents and quarrelsome tones, outraged by glaring colors and inharmonious lines.

(k) Polarity, or action and reaction, we meet in every part of nature ; in darkness and light ; in heat and cold ; in the ebb and flow of waters ; in male and female ; in the inspiration and expiration of plants and animals ; in the equation of quantity and quality in the fluids of the animal body ; in the systole and diastole of the heart ; in the undulations of fluids and of sound ; in the centrifugal and centripetal gravity ; in electricity, galvanism, and chemical affinity. Superinduce magnetism at one end of a needle, the opposite magnetism takes place at the other end. If the south attracts, the north repels. To empty here, you must condense there. An inevitable dualism

bisects nature, so that each thing is a half, and suggests another thing to make it whole: as spirit, matter; man, woman; odd, even; subjective, objective; in, out; upper, under; motion, rest; yea, nay.

Whilst the world is thus dual, so is every one of its parts. The entire system of things gets represented in every particle. There is somewhat that resembles the ebb and flow of the sea, day and night, man and woman, in a single needle of the pine, in a kernel of corn, in each individual of every animal tribe. The reaction, so grand in the elements, is repeated within these small boundaries. For example, in the animal kingdom the physiologist has observed that no creatures are favorites, but a certain compensation balances every gift and every defect. A surplusage given to one part is paid out of a reduction from another part of the same creature. If the head and neck are enlarged, the trunk and extremities are cut short.

The theory of the mechanic forces is another example. *What we gain in power is lost in time; and the converse. The periodic or compensating errors of the planets is another instance. The influences of climate and soil in political history are another. The cold climate invigorates. The barren soil does not breed fevers, crocodiles, tigers, or scorpions.

The same dualism underlies the nature and condition of man. Every excess causes a defect; every defect an excess. Every sweet hath its sour; every evil its good. Every faculty which is a receiver of pleasure has an equal penalty put on its abuse. It is to answer for its moderation with its life. For every grain of wit there is a grain of folly. For every thing you have missed, you have gained something else; and for every thing you gain, you lose something. If riches increase, they are increased


that use them. If the gatherer gathers too much, nature takes out of the man what she puts into his chest ; swells the estate, but kills the owner. Nature hates monopolies and exceptions. The waves of the sea do not more speedily seek a level from their loftiest tossing, than the varieties of condition tend to equalize themselves. There is always some leveling circumstance that puts down the overbearing, the strong, the rich, the fortunate, substantially on the same ground with all others. Is a man too strong and fierce for society, and by temper and position a bad citizen, a morose ruffian, with a dash of the pirate in him,—nature sends him a troop of pretty sons and daughters, who are getting along in the dame's classes at the village school, and love and fear for them smoothes his grim scowl to courtesy. Thus she contrives to intenerate the granite and feldspar, takes the boar out and puts the lamb in, and keeps her balance true.—Emerson: *Essays, First Series, Compensation.*

✕ (1) In every land the same phenomenon presents itself—the greatest artists are heretics in sociology. Tolstoï does not stand alone in Russia. To name only one of his contemporaries, Dostoievsky, scarcely his inferior in power and skill, was a revolutionist. Turn to Scandinavia. One name stands supreme in her literature, the name of Ibsen, whose attitude to the institutions of society has been described as anarchistic. Next to him we find Bjørnsen, an active republican propagandist and opponent of the government. In Germany no one can question the primacy in art, extending over the past thirty years, of Richard Wagner, and it would be easy to quote passage after passage from his prose works which would entitle him to rank among the foremost German Socialists. In France, one name dominates the literature of

this century as that of Voltaire did the last ; it is the name of Victor Hugo—Hugo, the climax of whose masterpiece is the apotheosis of the barricade, whose favorite hero is an outlaw, and whose meanest villain is Javert, the representative of law and order ! Among living French authors Zola easily holds the most conspicuous place, and his works show (take *L'Argent*, for instance) that he, too, is awake to the defects of society. His heroic attitude to-day in combating the devilish military spirit of his country and defending the oppressed Jew demonstrates that he has in him the making of a true reformer. There are only two writers in Italy whose books are read, and deserve to be read, in other lands. They are Dé Amicis and Lombroso, both of them Socialists, the former having been elected Deputy on the Socialist ticket a few weeks ago. In America I need only cite the name of Mr. Howells, who is universally acknowledged as our first novelist, and whose action in courageously petitioning for the pardon of the Anarchists of Chicago still puzzles the critics, not to speak of his philosophy of life in general. I think I have now covered most of the literatures of the day. If I have omitted Spain and Poland, it is only because I am not familiar with their writers. In the department of painting I am not qualified to speak, but I know that Repin, the greatest of Russian artists ; Millet, the greatest of French ; and Watts, the greatest of English ; not to mention Burne-Jones, Walter Crane, and others—are all of them more or less tarred by the same brush.

(*m*) The innate depravity of inanimate things is well known. An umbrella will refuse to open when it begins to rain. Shoe-strings break when you are furthest from a base of supplies, and buttons come off when you are furthest from the domestic repair shop ; the pernicious habits

of collar buttons and stovepipes are so well known as to be proverbial. If any man doubts that a perverse and ill-conditioned soul lurks somewhere in a needle, let him try to sew on a suspender button. The furnace takes advantage of zero weather to get out of order, just as the bathtub does of the first warm, oppressive days of June. The cunning of slippers is another example. The pair never hide together, but one will get into an old arctic in the hall and the other will retreat to the furthest corner under the desk, and, with an instinct like that of the bugs which pretend to be pieces of twigs, will turn itself sole upwards so as to match the floor. How a knife gets into the pocket of the waistcoat you are not wearing is not known, though the fact is well established. If you wish to break a pair of eye-glasses, get a novel you especially wish to read and sit down with it before an open fire. Note particularly that the spring will not break before you become interested. If the book is dull or if you are forced to read it, the glasses will remain quiescent. Or, if you are straining your eyes, they never break. Why this is so, no one knows. "There are more things in heaven and earth, Horatio, than are dreamed of in your philosophy." The principle is well understood. Try to lose a thing and you cannot rid yourself of it; try to preserve it and it will lose itself.

 (n) Wright says that of 4340 convicts at one time in Massachusetts, 2991, or 68 per cent, were returned as having no occupation. . . . The warden of the Massachusetts state prison stated that of 220 men sentenced during that year 147 were without a trade, or any regular means of earning a living. In Pennsylvania, during a recent year, nearly 88 per cent of the penitentiary convicts had never been apprenticed to any trade or occupation; and

this was true also of $68\frac{1}{2}$ per cent of the convicts sentenced to county jails and workhouses in the same state during the same year. Further, in Mr. Frederic Wines's recent report on homicide in the United States in 1890, it is shown that of 6958 men, 5175, or more than 74 per cent of the whole, were said to have no trade.—Ferrero: *Work and Morality*, *Forum*, Nov. 1896, pp. 363-4.

(o) Aurora forgot to ask youth for her lover, and though Tithonus is immortal, he is old. Achilles is not quite invulnerable; the sacred waters did not wash the heel by which Thetis held him. Siegfried, in the *Nibelungen*, is not quite immortal, for a leaf fell on his back whilst he was bathing in the dragon's blood, and that spot which it covered is mortal. And so it must be. There is a crack in everything God has made. It would seem, there is always this vindictive circumstance stealing in at unawares, even into the wild poesy in which the human fancy attempted to make bold holiday, and to shake itself free of the old laws,—this back-stroke, this kick of the gun, certifying that the law is fatal; that in nature nothing can be given, all things are sold.—Emerson: *First Series, Compensation*.

(p) Often we are ourselves struck at the strange differences in our successive views of the same thing. We wonder how we ever could have opined as we did last month about a certain matter. We have outgrown the possibility of that state of mind, we know not how. From one year to another we see things in new lights. What was unreal has grown real, and what was exciting is insipid. The friends we used to care the world for are shrunken to shadows; the women once so divine, the stars, the woods, and the waters, how now so dull and common!—the young girls that brought an aura of infin-

ity, at present hardly distinguishable existences ; the pictures, so empty ; and as for the books, what *was* there to find so mysteriously significant in Goethe, or in John Mill so full of weight ?—James: *Psychology*, ch. XI.

(*q*) Natural instincts are lost under domestication : a remarkable instance of this is seen in those breeds of fowls which very rarely or never become “ broody ” ; that is, never wish to sit on their eggs. Familiarity alone prevents our seeing how largely and how permanently the minds of our domestic animals have been modified. It is scarcely possible to doubt that the love of man has become instinctive in the dog. All wolves, foxes, jackals, and species of the cat genus, when kept tame, are most eager to attack poultry, sheep, and pigs ; and this tendency has been found incurable in dogs which have been brought home as puppies from countries such as Terra del Fuego and Australia, where the savages do not keep these domestic animals. How rarely, on the other hand, do our civilized dogs, even when quite young, require to be taught not to attack poultry, sheep, and pigs ! No doubt they occasionally do make an attack, and are then beaten ; and if not cured, they are destroyed ; so that habit and some degree of selection have probably concurred in civilizing, by inheritance, our dogs. On the other hand, young chickens have lost, wholly by habit, that fear of the dog and cat which no doubt was originally instinctive in them ; for I am informed by Captain Hutton that the young chickens of the parent-stock, the *Gallus bankiva*, when reared in India under a hen, are at first excessively wild. So it is with young pheasants reared in England under a hen. It is not that chickens have lost all fear, but fear only of dogs and cats ; for if the hen gives the danger-chuckle, they will run (more especially young tur-

keys) from under her, and conceal themselves in the surrounding grass of thickets; and this is evidently done for the instinctive purpose of allowing, as we see in wild ground-birds, their mother to fly away. But this instinct retained by our chickens has become useless under domestication, for the mother-hen has almost lost, by disuse, the power of flight.—Darwin: *Origin of Species*, § 402.

(*r*) The universal nature, too strong for the petty nature of the bard, sits on his neck and writes through his hand; so that when he seems to vent a mere caprice and wild romance, the issue is an exact allegory. Hence Plato said that “poets utter great and wise things which they do not themselves understand.” All the fictions of the Middle Age explain themselves as a masked or frolic expression of that which in grave earnest the mind of that period toiled to achieve. Magic, and all that is ascribed to it, is a deep presentiment of the powers of science. The shoes of swiftness, the sword of sharpness, the power of subduing the elements, of using the secret virtues of minerals, of understanding the voices of birds, are the obscure efforts of the mind in a right direction. The preternatural prowess of the hero, the gift of perpetual youth, and the like, are alike the endeavor of the human spirit “to bend the shows of things to the desire of the mind.”

In *Perceforest* and *Amadis de Gaul*, a garland and a rose bloom on the head of her who is faithful, and fade on the brow of the inconstant. In the story of the *Boy and the Mantle*, even a mature reader may be surprised with a glow of virtuous pleasure at the triumph of the gentle Genelas; and, indeed, all the postulates of elfin annals—that the fairies do not like to be named; that their gifts are capricious and not to be trusted; that who seeks a

treasure must not speak, and the like—I find true in Concord, however they might be in Cornwall or Bretagne.

Is it otherwise in the newest romance? I read the *Bride of Lammermoor*. Sir William Ashton is a mask for a vulgar temptation, Ravenswood Castle a fine name for proud poverty, and the foreign mission of state only a Bunyan disguise for honest industry. We may all shoot a wild bull that would toss the good and beautiful, by fighting down the unjust and sensual. Lucy Ashton is another name for fidelity, which is always beautiful and always liable to calamity in this world.—Emerson : *Essays, First Series, History*.

4. Write an inductive argument which shall seek to establish any one of the following conclusions, fixing in your own mind upon the audience you address. Analyze the argument completely, and state whether it is capable of refutation by any means.

- ✓(a) All times of great need bring forth great men.
- ✓(b) People are not content with what they have.
- (c) All men who find power lose personal freedom.
- (d) Minds are acted upon by each other without any apparent means of communication.
- (e) People lose their romantic sentiments as they gain experience.
- ✓(f) All great men are self-made.
- (g) All men who accomplish a great work spend a long period in preparation for that work.
- ✓(h) All great reformers are the exponents of the spirit of their times.
- ✓(i) All evil is a result of selfishness.
- (j) All great men have gained little from books.
- ✓(k) All friendships are based upon a certain likeness of character.
- (l) All progress is the result of discontent.

CHAPTER IV.

DEDUCTIVE REASONING.

THROUGH inductive reasoning, as we have seen, we learn the characteristics of a whole class by experiences with particular members of that class. We conclude that green apples as a class are sour and hard, because several which we have tasted were sour and hard. But we often make use of such a conclusion as this to tell us something about an unknown member of the same class, as when we judge a certain green apple, which we have not tasted, to be sour and hard. It is evident that we cannot in this case come directly to the belief that the apple is sour and hard, as we could do if we had actually tasted it. We do not positively know that this green apple is sour and hard. We only infer that it is. That is, we come to a conclusion concerning it, without having actually had experience with it.

A conclusion which thus transcends experience is called an inference. We drew inferences, it will be remembered, in the case of inductive reasoning. When we concluded that all green apples are hard and sour, we did so not because we had actually tasted all green apples and found them individually hard and sour, but because we inferred the hardness and sourness of the class of green apples from that of several green apples which we had

tasted. Each of these conclusions, then, that all green apples are hard and sour and that this (untasted) green apple is hard and sour, has been gained, not directly from experience, either with the whole class or with the single individual concerned, but indirectly through a process of reasoning, which, although based on experience, passes beyond it. Both these conclusions are, therefore, inferences. It will be well to note sharply the distinction between such logical conclusions as these, and the direct results of experience, with which latter, argumentation has nothing to do.

Let us now examine somewhat more closely that particular variety of logical inference by which one is led from the sourness and hardness of the whole class of green apples, to the sourness and hardness of a particular green apple as yet untasted. How are we enabled to reach the conclusion that this particular green apple is hard and sour? We do not, as has been said, determine the point by direct experience. We are, however, practically as sure of it as if we had actually tasted and found the apple hard and sour. If interrogated as to the source of our judgment that this particular green apple is hard and sour, we should at once answer, "Why, I know it because all green apples are hard and sour." We are drawing a conclusion, then, as to the characteristic of one member of a class, on the basis of our experience with other members of the same class.

We find ourselves making judgments of this kind every day. "That snow won't pack," we say, though we have not tried to pack it; or, "The surface of that cloth is a regular dust-catcher," though no dust as yet clings to it. We buy a seat at the Harvard-Yale football game, sure that it is worth seeing, though as yet we have not seen

it; or pay half a dollar more for a certain make of glove in the persuasion that it is more durable, before we have worn it at all. In all these cases, it is evident, we conclude something about an individual member of a class, on the basis of a previous conclusion about the class as a whole. Having often tried to pack snow of a certain light, dry sort, we have come to the conclusion that all snow of this sort refuses to cohere, and can now infer that this particular snow, having the same light, dry consistency, has also the same reluctance to being packed. By experience we have learned that cloth whose surface presents a peculiar unequal, fuzzy appearance catches dust, hence we suppose that this particular piece of cloth, whose surface presents this appearance, tends also to retain the dust. The Harvard-Yale football games are always worth seeing, and this make of glove has proved itself to be especially durable. Hence this particular game is sure to be worth seeing, and this particular pair of gloves to be serviceable.

The logical process by which one reaches such conclusions as these is perhaps somewhat less simple than at first appears. It is evident that we have no right to ascribe the characteristic of durability to this particular pair of gloves on the strength of their belonging to a class of durable gloves, unless we take it for granted that the members of a class have the characteristics of the class. Inductive reasoning, we found, depends upon the principle that a class has the characteristics of its individual members. Deduction seems to invert this assumption, declaring not that what is true of the members of a class is true of the class, but that what is true of the class is true of each of its members. Only if this assumption holds, can one possibly conclude that because all the Har-

vard-Yale football games are worth seeing this one is worth seeing. We may, then, formulate the deductive assumption as follows: "*What is true of the class is true of an individual member of that class.*"

Upon this assumption is built all deductive reasoning. Since what is true of a class as a whole is true also of its individual members, in order to conclude that a certain characteristic belongs to a given individual, one has only to know that this characteristic pertains to a certain class and that the individual in question belongs to that class.

These, then, are the stages of the deductive process.

- I. A certain class has this particular characteristic.
- II. The individual in question belongs to this class.
- III. The individual in question has this particular characteristic.

These stages appear in the process of reasoning by which one comes to the conclusion that an American woman whom he has never heard speak has a nasal voice, because all American women have this characteristic. Believing that what is true of the class is true of a particular member of the class, and having already arrived at the inductive conclusion that all American women have nasal voices, as soon as one learns that this particular woman is American, he is straightway forced to the conclusion that she has a nasal voice. He has assigned a certain characteristic to a whole class, identified an individual with a class, and in consequence has been obliged to assign the characteristic of the class to the individual.

This process does not fundamentally differ from that which takes place when we say that a certain individual must belong to a certain class because it has the characteristics peculiar to the class; as, for instance, when one says, "Of course she's an American. Didn't you hear her

nasal voice? ” The speaker has reasoned that what is true of all people who have nasal voices, namely, that they belong to the class of Americans, must be true of this particular person who has a nasal voice. He has previously come to the conclusion that the entire class of people who have nasal voices is included in the class of Americans. Observing, then, that this individual belongs to the class of people who have nasal voices, he concludes that this individual must also fall within the class of Americans. Here we have the assignment to a class, of all individuals having a certain characteristic, the identification of a particular individual with those having this characteristic, and the consequent assignment of the individual to the class.

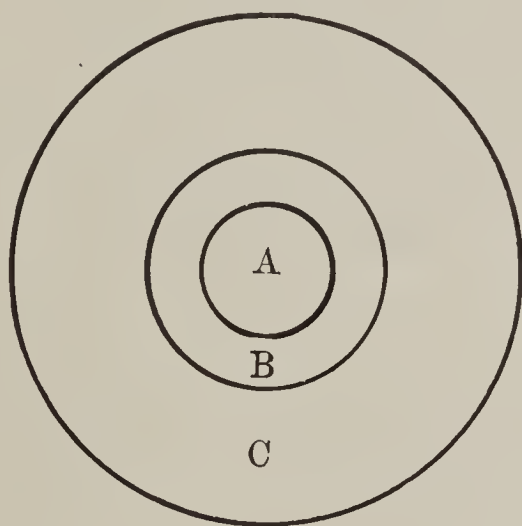
At first sight the processes leading to these two conclusions—“ She has a nasal voice ” and “ She is an American ”—may seem different, but closer inspection reveals their essential identity. The inductive conclusion, we learned from the previous discussion of inductive reasoning,* declares that all the members of a certain class have a certain characteristic, or, what amounts to the same thing, that the whole of a certain class is included in a larger class, as the whole of the class china in the class of breakable things, or the whole of the class roses in the class of prickly-stemmed things. In like manner the deductive conclusion declares that an individual has the characteristic of its class, or that it belongs to the class whose characteristic it shares, or, which includes these two formulæ, that an individual belongs to the class which includes the smaller class to which it belongs. Thus the conclusion, “ She has a nasal voice,” says, in effect, that

* Chapter II.

the individual, belonging to the smaller class of Americans, is, by virtue of this fact, also a member of the larger class of people with nasal voices. Or, the conclusion "She is an American," asserts implicitly that the individual, belonging to the class of people who have nasal voices, is thereby constituted a member of the class of Americans, which includes the whole class of people who have nasal voices.

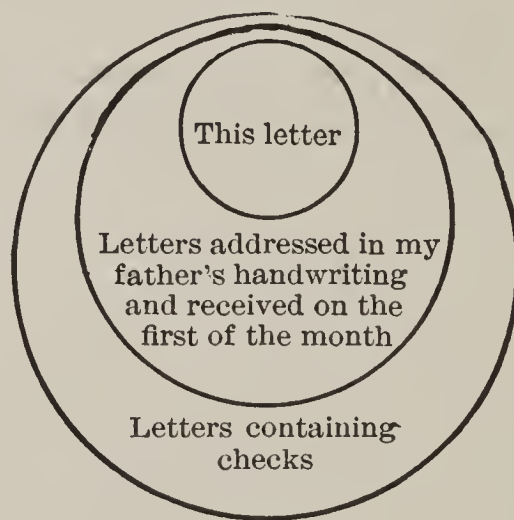
This view of the case reduces deductive reasoning to the process of concluding that A is contained in C, if it is also contained in B and B is contained in C. It is virtually saying, "I left that mortgage in my office, for it is in my desk, and my desk is in my office," or "I have a five-dollar bill in my pocket, for it is in my purse, and my purse is in my pocket."

We have here, then, the most general formula for deductive reasoning. It may be represented graphically by the old device of circles.



It is clear that A is included in C, since B is included in C and A is included in B. Thus one is safe in coming to the conclusion that an unopened letter, just received,

contains a check, if all letters addressed in this handwriting and arriving at this particular time in the week or month do contain checks. The process of reasoning would be as follows : All letters addressed in my father's handwriting and received on the first of the month contain a check. This letter is addressed in my father's handwriting and is received on the first of the month. Therefore it contains a check. That is,—This individual letter belongs to the class of letters received on the first of the month addressed in a certain handwriting; and this class of letters is wholly included in the class of letters which contain checks ; hence this letter belongs to the class of letters containing checks.



Deductive reasoning has, then, for its task the assigning of a certain individual to a class, on the basis of that individual's membership in another class which is wholly included in the class first mentioned. Induction has prepared the way for the successful performance of this task, by assigning the smaller class to the larger. This having been done, deduction fulfills the process by referring a

given individual to the smaller class, and thus to the larger class which includes the smaller.

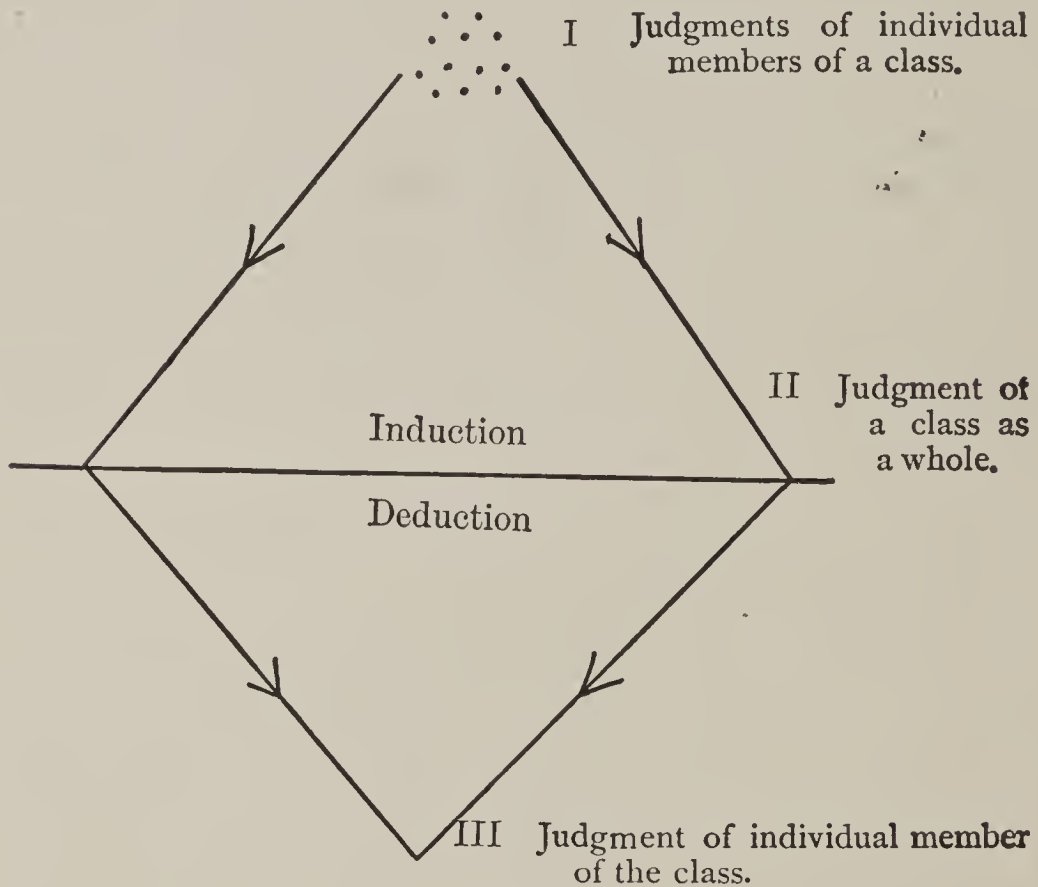
The significance of the term “deduction” as applied to the kind of reasoning discussed in this chapter is commonly explained according to its etymology by saying that deductive reasoning leads from a general statement of the characteristic of a class, to the particular statement of the characteristic of a single individual in that class. Induction, we found, brings scattered judgments concerning the individual members of a class together into a single judgment of the class as a whole. As contrasted with this process, deduction may be said to draw this larger judgment of the class down to a particular point, the judgment concerning an individual member of the class, hitherto unknown. This conception of the essential difference between the two processes might be represented by the following diagram.*

We should now examine somewhat more minutely the elements of deductive reasoning. Of its three stages we have already noted that the first assigns the smaller class to the larger, or, to use convenient scientific terms, the species to the genus; the second includes the individual in its species, and the third declares the membership of the individual in the genus. Thus, if we conclude that Sousa’s new march, which we have not yet heard, is lively and “catching,” because all his marches are so, we first declare that the species, Sousa’s marches, belongs to the genus, marches that are lively and “catching,” then assert that this particular march belongs to the species, Sousa’s marches, and hence are forced to conclude that

* The relations between inductive and deductive reasoning are further discussed in Appendix B.

this particular march is included also in the genus, marches that are lively and “catching.”

This entire process of reasoning, as thus skeletonized, is termed a syllogism. Each of its three stages, like the stages of inductive reasoning, asserts or declares something, makes a complete statement, and hence is known



as a proposition. But each of these three propositions is also, for convenience, distinguished from each of the others by a specific name. That proposition which affirms the inclusion of species in genus is termed the major premise; that which declares the inclusion of individual in species, the minor premise; and that which asserts the inclusion of the individual in the genus, the con-

clusion. Thus in the syllogism previously discussed, the proposition, "All Sousa's marches are lively and 'catching,'" is the major premise; "This march is one of Sousa's marches" is the minor premise; and "This march is lively and 'catching'" is the conclusion.

The significance of the terms, major premise and minor premise, as applied to the earlier propositions of the syllogism, does not fully appear until the propositions themselves have been further analyzed. We have seen that the conclusion, toward which the deductive process tends, assigns the individual to that larger class which we have called the genus. To accomplish this classification of the individual is the end of deductive reasoning. Of the three ultimate elements in deductive reasoning, the genus, the species, and the individual, only the first and the last are of prime importance. The second is used only as a go-between, a means of achieving the classification of the individual under the genus. It is impossible to say directly that the individual is included under the genus; we can know that only by first assigning it to the species which is embraced by the genus. Hence we use the species to form a bridge for us from the individual to the genus. It has no value save as an intermediary, hence it is commonly known as the middle term, while the individual and the genus are called the extreme terms, or the extremes. The extremes, however, are further distinguished; the genus, as the larger term, being named the major, and the individual, as the smaller, receiving the designation of the minor.

These, then, are the three terms of the syllogism—the major, representing the genus, to which the individual is to be assigned; the minor, representing the individual, which is to be assigned to the genus; and the middle, rep-

representing the species, through which the individual is brought into connection with the genus. The location of these terms in the syllogism determines the names applied to the premises. The major premise, which assigns the species to the genus, plainly deals with both the major and the middle terms ; the minor premise, which refers the individual to its class, has to do with both minor and middle terms ; while the conclusion, classifying the individual with the genus, involves the major and the minor terms. The names of the premises, it will be noted, correspond each with the name of the term of first importance which it contains. The middle term, being comparatively colorless, is left out of the reckoning altogether, and the proposition containing both the major and the middle term is known as the major premise, while that containing the minor and the middle term becomes thereby the minor premise. The conclusion, which contains both major and minor terms, is designated by the name of neither.

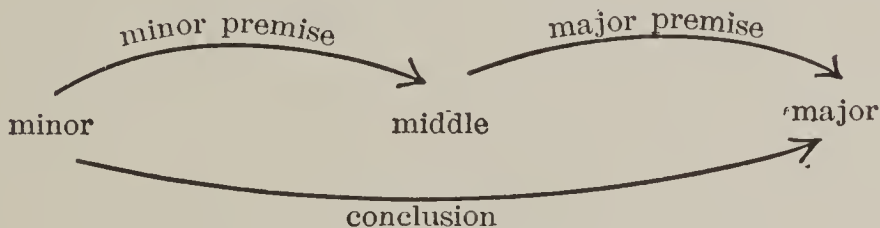
The location of terms in the syllogism may be represented by such a skeletonized formula as the following :

- I. Major premise: middle..... major.
- II. Minor premise: minor..... middle.
- III. Conclusion: minor..... major.

This formula shows the syllogism bound together by a triple link. The middle and the major terms are first connected, then the minor with the middle, and last the minor with the major. The connections between these terms might thus be shown by diagram.

The deductive syllogism, then, represents a reasoning process whose elements are very closely linked together. So close and so well established is this connection, that,

given the conclusion, the entire syllogism can easily be built up. Let us say that we wish to determine what reasoning process might fairly lead to the conclusion that J. H. Shorthouse's *John Inglesant* ought to be purchased for a certain school library. The conclusion has already been formulated—" *John Inglesant* ought to be purchased for this school library." The minor term, *John Inglesant*, is assigned to the major term, that is, to the class of books which ought to be purchased for this library. Only the middle term is lacking ; and this at once declares itself in answer to the question, " Why should we think that *John Inglesant* ought to be purchased for this



library ? ” Plainly, one could come to this conclusion because he believed that all good historical novels, in the number of which he counts *John Inglesant*, should be purchased for this library, in which case the middle term is apparent—the class of good historical novels. Once the minor term, *John Inglesant*, is referred to this class, and this class is included in the larger class of books which should be purchased for the school library, the triple connection is made, and *John Inglesant* is thereby declared to belong to that class of books which should be purchased for the school library.

The determination of the way to a given deductive conclusion depends, then, upon the discovery of the appropriate middle term. The conclusion itself furnishes the major term and the minor, so that the task of filling out

the syllogism resolves itself into the search for the intermediary through which the minor term has been brought into relation with the major.

Such a typical form of syllogism as that which we have considered in this chapter submits itself, we may notice, to the following tests : It is made up of three terms, and three only, these being so arranged that they constitute three distinct propositions. Each term appears twice in the entire syllogism, but only once in any one proposition. Each term represents either a class or a member of a class ; that representing the largest element in the syllogism being called the major term, that indicating the smallest the minor term, and that standing for the intermediary between these two, the middle term. Each term is expressed throughout the syllogism in the same form of words. Each of the three propositions has its own peculiar function in the syllogism ; the first, called the major premise, assigning the middle to the major term ; the second, or the minor premise, including the minor in the middle term ; and the third, or the conclusion, declaring the minor to be a member of the class represented by the major term.

So much for the typical form of the simple syllogism. Many other forms are known to the books of logic, but we need concern ourselves with them only so far as to see how they may be reduced to this more primitive type.

Syllogisms which are technically called “ simple ” are those whose propositions are all simple, containing but a single subject and predicate. The following is an illustration :

- I. All silk is smooth to the touch.
- II. This fabric is silk.
- III. This fabric is (will prove) smooth to the touch.

Such a syllogism as this may readily be distinguished from complex or hypothetical syllogisms, at least one of whose propositions is complex, that is, made up of one or more propositions. Of the complex syllogism either of the following may serve as examples :

I. If silk is smooth to the touch, dust will not cling to it.

II. Silk is smooth to the touch.

III. Dust will not cling to it.

or,

I. Either silk is smooth to the touch, or woolen is.

II. Silk is smooth to the touch.

III. Woolen is not smooth to the touch.

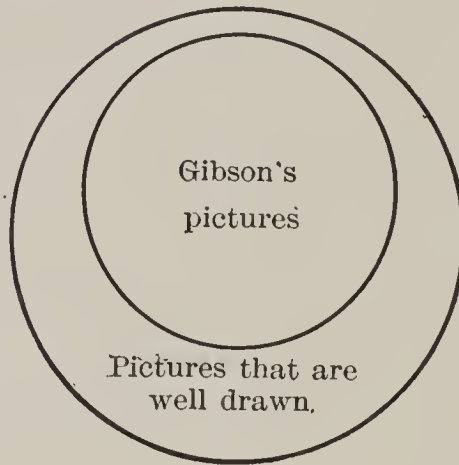
In each of these complex syllogisms, while the minor premise is a simple proposition, the major premise is complex, made up of two simple propositions, "Silk is smooth to the touch," and "Dust will not cling to it," or, in the second illustration, "Silk is smooth to the touch," and "Woolen is not smooth to the touch."

We shall consider in turn the various forms of both simple and complex syllogisms and the means by which each may be reduced to the typical form which has been previously defined.

Simple syllogisms of our typical form have invariably a major premise of the following order : "All poverty is the result of improvidence," "All lies are unjustifiable," "All the good die young," "All laws ought to be enforced." Each of these propositions assigns an entire class to another larger class. Absolutely the whole of the class of lies is included in the class of unjustifiable things ; absolutely the whole of the class of laws, in the class of things that ought to be enforced. Such a proposition is

called a universal affirmative proposition. We have heretofore represented it as follows :

I.

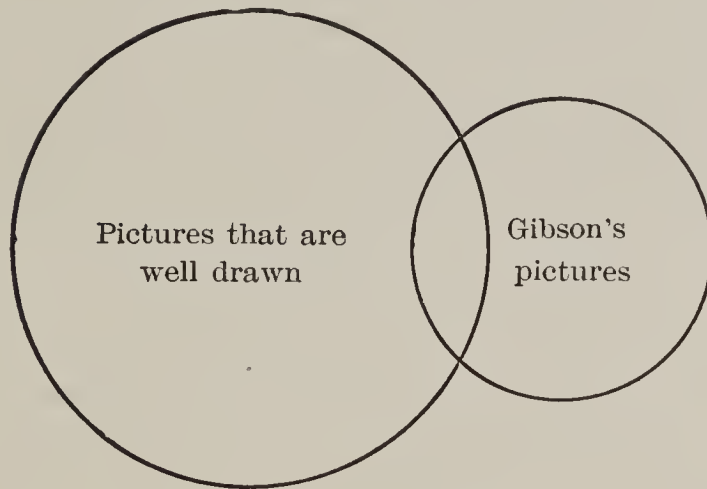


But one may sometimes be tempted to use for the major premise of a syllogism propositions somewhat differing from these in form. He may, for instance, attempt to substitute a statement not quite so sweeping. "Some lies are justifiable," he may say; "Most laws ought to be enforced," "Some good people die young," "Much poverty is the result of improvidence." These propositions may be termed particular affirmative propositions. Not the whole of the smaller class is included in the larger, but only some particular portion of it. The two classes intersect, but that is all.

The universal and the particular propositions are thus sharply distinguished so far as concerns the degree of inclusion of the smaller class in the larger. Both of them, however, affirm this inclusion, either in whole or in part, differing in this respect from the negative propositions, which deny it. Such a proposition one uses in asserting

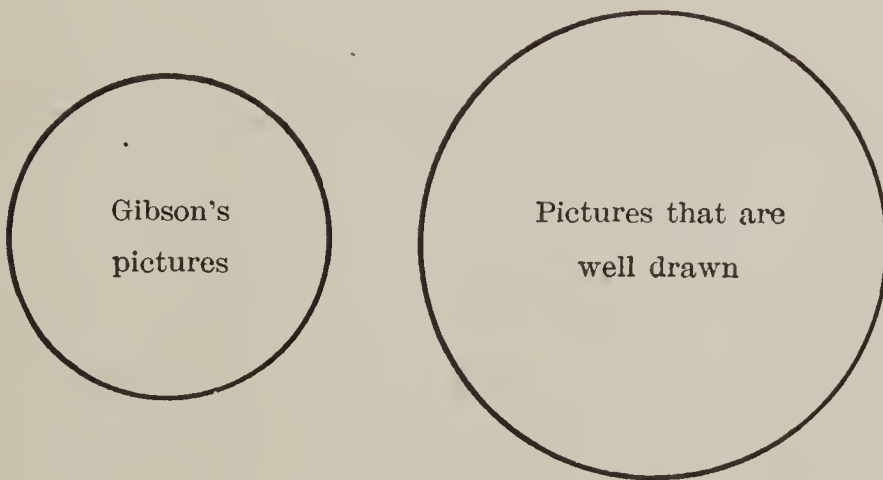
that “No lies are justifiable,” that “No novels are worth reading,” that “No crimes are permanently hidden,” or

II.



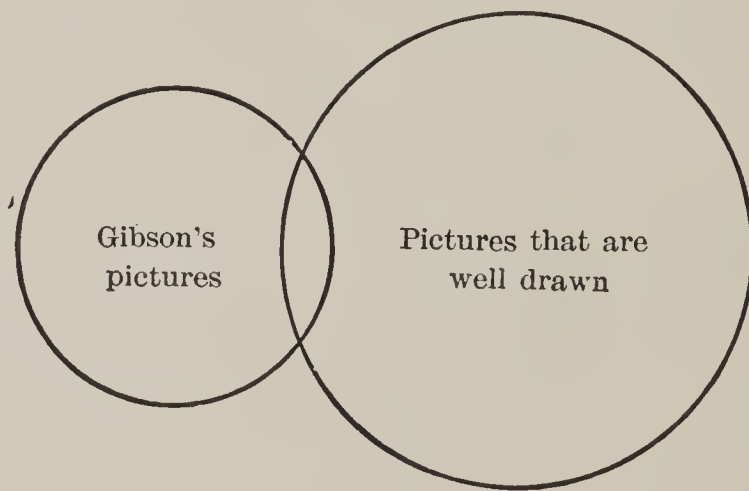
that “No missionary work pays.” The inclusion of the one class in the other is here explicitly denied. No single member of the class of lies falls within the class of justifiable actions ; no smallest part of the class of novels belongs within the limits of the class of books worth reading. The one class is wholly excluded from the other, as in the following diagram :

III.



It is possible, however, to affirm the exclusion of the smaller from the larger class, not in whole, but in part. One does not venture to assert that no lies are justifiable, but is sure that not all lies are justifiable. Or he maintains that not all novels are worth reading, or that not all missionary work pays. Some part of the smaller class thus falls outside the limits of the larger, the relation of the two classes being represented by such a figure as this :

IV.



It will be noted that this figure is identical with the one marked II., representing the particular affirmative proposition.

These, then, are the four assertions possible to be made concerning any class of things—the universal affirmative, the particular affirmative, the universal negative, and the particular negative. If the major premise of our syllogism is a universal affirmative proposition, the syllogism has the typical form. If, however, one attempts to substitute for this universal affirmative a particular proposition, whether affirmative or negative, it becomes at once impossible for the conclusion to declare that the minor

term falls within the major. The middle term is not wholly included in the major, hence no matter how certain we may be that the minor falls somewhere in the middle term, we cannot know that it is also included in the major. Some of Gibson's pictures are well drawn, we may say, and this is one of Gibson's pictures; but whether it is one of the number well drawn, or one of the number not well drawn, it is impossible to say. This particular picture may be either well drawn or not well drawn—one cannot tell which. Its location is as ambiguous as that of a certain paper, a mortgage, let us say, which one asserts to be somewhere among his papers. So much we are glad to know, but where are the papers? If the reply be, "Oh, some of them are in my desk at the office, and some in an old trunk in the attic at home, and some in the safety deposit vault in the bank," we have not received much information as to the exact situation of this particular paper. The minor term, this mortgage, has been assigned to the middle, our friend's papers; but the middle, our friend's papers, has not been wholly included in the major term, say his desk at the office. Hence it is impossible to say that the mortgage is in the desk. It may chance to be, of course, but one is not sure.

A difficulty of this sort, occasioned by the use of a particular, rather than a universal, proposition for the major premise of the syllogism, may be remedied by narrowing the middle term so that it is wholly included in the major. Thus, instead of asserting that "Some novels are worth reading," one may venture the declaration that "All novels written by standard authors are worth reading." If the novel in question was written by a standard author, we are then entitled to conclude that it is worth reading.

If we attempt to use a universal negative proposition as the major premise of a syllogism, our attention is arrested by the fact that the major term seems to stand in the major premise for one class of things, and in the conclusion for another. For instance, if we say :

- I. None of Gibson's pictures are well drawn.
- II. This is one of Gibson's pictures.
- III. This picture **is** not well drawn.

our major term in the major premise represents "pictures that are well drawn," and in the conclusion "pictures that are not well drawn." And, further, this form of proposition fails to meet the requirement of our typical syllogism, that its major premise shall include the middle term in the major. The premise, "None of Gibson's pictures are well drawn," rather excludes the middle from the major term, negates the inclusion of the one in the other. But let us see whether this negative proposition may not be translated into an equivalent form which will meet the requirements for the typical syllogism. Gibson's pictures, if taken as a whole, must be either well-drawn or not-well-drawn. If none of them are well drawn, all of them must be not-well-drawn. Thus we are furnished at once with the major premise we need.

- I. All Gibson's pictures are not-well-drawn.
- II. This is one of Gibson's pictures.
- III. This picture is not-well-drawn.

In like manner, the particular negative proposition, "Some of Gibson's pictures are not-well-drawn," may be reduced to our typical major premise when once its middle term has been so narrowed as to render the premise universal.

These varieties of simple syllogism may thus be readily

reduced to the typical form. The similar transformation of complex syllogism to the simple type we must now consider.

On the border-line between simple and complex syllogisms stand those syllogisms whose major premises contain a temporal clause, and thus seem to be complex propositions, though capable of easy reduction to the simple form of statement. Such a syllogism is the following :

- I. When they need me, I must go.
- II. They need me now.
- III. I must go now.

If one attempt to analyze out from this conclusion its minor and major terms, he finds the minor to be “ now ” or “ this time,” and the major “ times when I must go.” The middle term is, then, plainly “ times when they need me ” and the syllogism reduces to the typical form :

- I. All times when they need me are times when I must go.
- II. This time is one of the times when they need me.
- III. This time is one of the times when I must go.

A syllogism whose major premise contains a temporal clause can usually be resolved into a simple syllogism of the required form by recognizing the terms for the time-elements they actually are.

By similar means, all complex syllogisms are reduced to the typical form. Complex syllogisms are, as we have noted, syllogisms whose major premises are complex propositions. A complex proposition is defined as “ a combination of two or more simple propositions in one sentence, the propositions being so related to each other that the truth or falsity of one proposition or set of propositions depends on the truth or falsity of the other proposi-

tion or set of propositions.” * If the two propositions are so associated in the sentence that the truth of one depends on the truth of the other, the proposition is called conjunctive, and the same name is applied to the syllogism of which it forms the major premise. Such a syllogism is that presented early in the chapter: †

- I. If silk is smooth to the touch, dust will not cling to it.
- II. Silk is smooth to the touch.
- III. Dust will not cling to it.

If, on the other hand, the two statements in a complex proposition are so related that the truth of one depends on the falsity of the other, and the falsity of one on the truth of the other, the proposition is called disjunctive, and the same name is applied to the syllogism in which such a proposition acts as major premise. One of the complex syllogisms before quoted is of the disjunctive variety :

- I. Either silk is smooth to the touch, or woolen is.
- II. Silk is smooth to the touch.
- III. Woolen is not smooth to the touch.

The conjunctive complex syllogism can readily be reduced to the typical form by analyzing out its component terms. Thus the syllogism

- I. If the charge be true, he is a rascal.
- II. The charge is true.
- III. He is a rascal.

presents, as its minor and major terms, “ he ” and “ rascals.” “ He ” is asserted by the conclusion to belong

* Fowler, T., *Deductive and Inductive Logic*, *Deductive Logic*, p. 113.

† Page 63.

to the class of rascals; but on what grounds? Simply because all men of whom this particular charge is true belong to the class of rascals. The syllogism, then, falls into this form :

- I. All persons of whom this charge is true are rascals.
- II. He is a person of whom this charge is true.
- III. He is a rascal.

In the same fashion may be reduced the syllogism,

- I. Unless the strikers have conceded something, the company ought not to yield.
- II. The strikers have conceded nothing.
- III. The company ought not to yield.

Inquiry into the reason for assigning this company to the class of companies who ought not to yield to their striking employees, develops the middle term and thus transforms the syllogism :

- I. Companies to whom their striking employees have conceded nothing are companies that ought not to yield.
- II. The company in question is a company to whom its striking employees have conceded nothing.
- III. The company in question is a company that ought not to yield.

The method by which disjunctive syllogisms may be moulded into the typical form is not essentially different. The major premise of a disjunctive syllogism may yield four different conclusions; as, for example:

- (a) I. Either the girl is stupid or she is lazy.
- II. She is stupid.
- III. She is not lazy.
- (b) I. Either the girl is stupid or she is lazy.
- II. She is not stupid.
- III. She is lazy.

- (c) I. Either the girl is stupid or she is lazy.
 II. She is lazy.
 III. She is not stupid.
- (d) I. Either the girl is stupid or she is lazy.
 II. She is not lazy.
 III. She is stupid.

A single one of these syllogisms will serve to illustrate the process of reduction which may be employed in the case of each. We note that this girl is assigned to the class of girls who are stupid because she also belongs to the class of girls who are not lazy, but who (we may suppose) fail to do satisfactory work in their classes; and all such girls, according to premise, are stupid girls. The syllogism, then, runs as follows:

- I. All girls who are not lazy, but who fail to do satisfactory work, are stupid.
 II. This girl is not lazy, but fails to do satisfactory work.
 III. This girl is stupid.

A second illustration of the process of resolution may be seen in the case of the syllogism:

- I. This cloth is either a great bargain or a great cheat.
 II. It is not a great cheat.
 III. It is a great bargain.

This syllogism takes on the accredited form, if thus rendered:

- I. All cloth which is fabulously low in price and is not a great cheat is a great bargain.
 II. This cloth is fabulously low in price and not a great cheat.
 III. This cloth is a great bargain.

Our consideration of the means for reducing various

forms of syllogism to the typical order may yield a single precept covering all such cases. From examination of the conclusion, the minor and the major terms may be derived. Supply the appropriate middle term from the premises of the syllogism, and group these three terms as in the typical form. If the inclusion of the middle in the major term be only partial, narrow the middle term until the major admits it; if the inclusion of the middle term in the major be denied, negate the major, so that the middle may be assigned to it.

The end attained by the reduction of all syllogisms to a prescribed form is the ready assurance of the correctness of a given process of deductive reasoning. If it yield itself to the mould of the typical syllogism, one may be assured of its validity without the numerous chances of error that arise when syllogisms of varied form are permitted. One is thus furnished with a simple test to which every piece of deductive reasoning may be submitted.

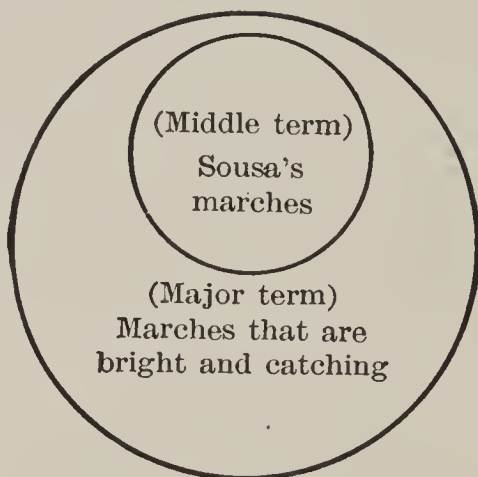
EXERCISES.

1. Turn back to Exercise 3 in Chapter I. What deductive inference would a child naturally draw when he came to a dark corner never seen before, having previously established the conclusion, "Dark corners are not dangerous"? Write the corresponding deductive inference for each of the inductive conclusions mentioned in Exercise 3, Chapter I.

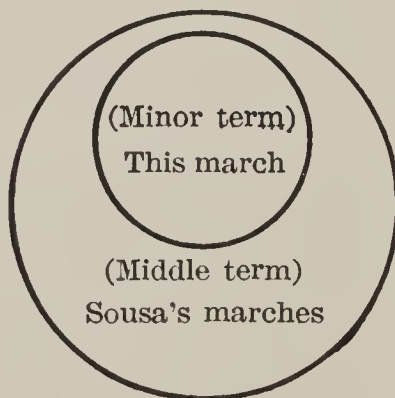
2. Note any deductive conclusions which you have reached during the past day or two. Be sure that you came to these conclusions by reasoning, not by direct experience with the object concerned. Analyze the reasoning process leading to each conclusion and diagram it by the method of circles.

3. Write out the complete syllogism of which each of the following propositions is the conclusion. Be able to identify each term in the syllogism and state its exact relationship to every other term. Name each proposition and account for its name. Diagram first each proposition and then the whole syllogism, by the method of circles as follows:

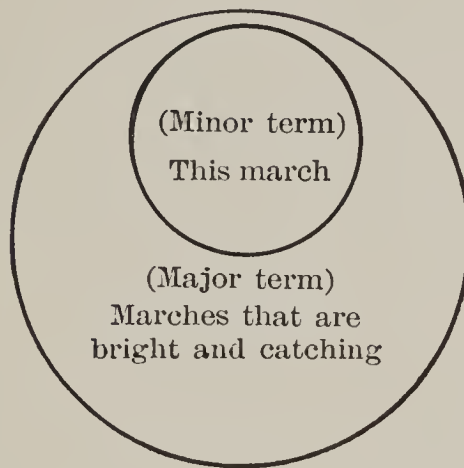
- I. All Sousa's marches are bright and "catching."
 - II. This march is one of Sousa's marches.
 - III. This march is bright and "catching."
- I. Major premise:



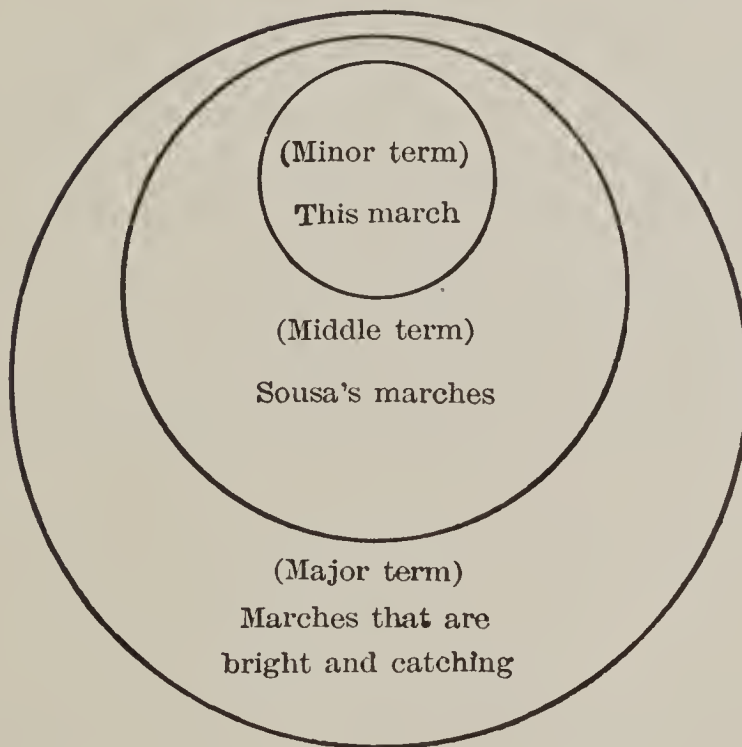
II. Minor premise:



III. Conclusion:



Whole syllogism:



- (a) That bird is a robin.
- (b) This toothache can be cured by the application of iodine.
- (c) This plant ought to be watered every day.
- (d) The ——* is a good make of bicycle.
- (e) This man is a German.
- (f) That child ought to be soundly whipped.
- (g) "Mädchen" is a neuter noun.
- (h) Mary Lewis is a lazy girl.
- (i) That is one of Joe Rider's books.
- (j) This cake is unwholesome.
- (k) This magazine article (unread) is interesting.
- (l) Si Hawkins ought to help raise our church debt.
- (m) Kipling ought to write more Jungle stories.
- (n) Golf is an easy game to learn.
- (o) This ship is seaworthy.
- (p) Your dress needs mending.
- (q) Nancy ought not to go out in this rain.

4. Write out in exact syllogistic form the reasoning implied in the following statements. Treat each syllogism as directed in Exercise 3, applying all the tests suggested on page 62 of the text.

- (a) "My strength is as the strength of ten,
Because my heart is pure."
- (b) "Blessed are the meek, for they shall inherit the earth."
- (c) "Wisdom is the principal thing: therefore get wisdom."
- (d) "I know I shan't like her. I hate people who say 'genteel.'"
- (e) "The Lord is my shepherd: I shall not want."

* The name of a certain make should be inserted.

(*f*) “ If that is one of James Hazzard’s schemes, I know it won’t work.”

5. Reduce each of the following syllogisms to the typical form, picturing each by the method of circles.

(*a*) I. Most long poems are hard to read.

II. *Paradise Lost* is a long poem.

III. *Paradise Lost* is (will prove) hard to read.

(*b*) I. When spring comes there are flowers in the woods.

II. Spring has come now.

III. There are flowers in the woods now.

(*c*) I. If she threw that gift away; she never cared for it.

II. She threw that gift away.

III. She never cared for it.

(*d*) I. No man who is rude to his inferiors is truly courteous.

II. This man is rude to his inferiors.

III. This man is not truly courteous.

(*e*) I. Either the act was one of thoughtlessness or it was one of deliberate unkindness.

II. It was not an act of deliberate unkindness.

III. It was an act of thoughtlessness.

(*f*) I. If you want me to like your friend, you must not overpraise him.

II. You want me to like your friend.

III. You must not overpraise him.

(*g*) I. No one who wishes Mrs. Bilby’s favor should decry Whitman.

II. Sarah wishes Mrs. Bilby’s favor.

III. Sarah should not decry Whitman.

(*h*) I. No Catholic eats meat on Friday.

II. This boy is a Catholic.

III. He does not eat meat on Friday.

- (i) I. Either you will leave the room, or I shall.
II. You will not leave the room.
III. I shall leave the room.
- (j) I. Many ministers' sons are unruly.
II. This boy is a minister's son.
III. This boy is unruly
- (k) I. Some uneducated men achieve great success.
II. This man is uneducated.
III. He will achieve great success.

6. Having reduced these syllogisms to the typical form, determine the reasoning process which has given rise to each major premise. Has the minor premise been established by reasoning?

7. Write an original syllogism in which the major premise is a particular affirmative proposition; one in which the major premise is a particular negative proposition; one in which the major premise is a universal negative proposition; one in which the major premise is a conjunctive proposition; one in which the major premise is a disjunctive proposition. Resolve each syllogism into the typical form.

8. Point out the inductive and the deductive elements involved in the reasoning processes leading to each of the following conclusions. What is the exact relation of these elements to each other? Write out a complete analysis of the reasoning process involved in each case.

- (a) Honesty is the best policy.
- (b) The best is always the cheapest.
- (c) The way of the transgressor is hard.
- (d) Strikes aid the cause of labor.
- (e) A prospective inheritance is a curse to a young man.
- (f) A good education is a good investment.

(*g*) The serious student of any subject should have a reading acquaintance with several languages.

(*h*) An unselfish person is the cause of selfishness in others.

(*i*) A successful author is an enviable person.

(*j*) An advertisement offering genuine diamonds for a dollar apiece is a fraud.

(*k*) A friend in need is a friend indeed.

9. Point out the inductive and deductive elements underlying the following actions:

(*a*) A person looks over a galley of proof, decides from the corrections already made upon it that the sign “*l.c.*” in the margin is used to indicate that a capital should be changed to a small letter, and therefore writes this sign in the margin opposite a word which is wrongly capitalized.

(*b*) One walks along a path over which have fallen a number of curious-looking burs which he has never seen before. He notices that several of them contain nuts, and hence begins deliberately to search for nuts in others.

(*c*) One looks over a large collection of pictures of the Madonna, and pointing to one he has never seen before, says: “That is surely one of Botticelli’s Madonnas.”

CHAPTER V.

DEDUCTIVE ARGUMENT.

OUR study of deductive reasoning has been, we must again remind ourselves, for an end beyond itself. There is a certain interest in the analysis of mental processes merely as such; but to gratify this interest one must turn to treatises on logic and psychology. Our concern with the typical modes of deductive reasoning is purely practical. We have learned to know them for one purpose, and one only, that we might thereby the more intelligently set about their reproduction in the minds of other people. The method of this reproduction we are now ready to consider. How is it, we may inquire, that a deductive reasoning process, such as those we have lately analyzed, is initiated in the mind of another person? How is one led by a speaker or writer to accept a certain deductive conclusion?

We have noted heretofore that a conclusion seldom gains acceptance by its mere statement. Rather, the whole train of reasoning which prepares for it must be repeated, stage after stage, in the hearer's mind, before the conclusion itself finds entrance. You are not disposed to concur in a friend's judgment that a certain young man must be the cause of great anxiety to his parents, without some knowledge of the reasons which have impelled him to this belief. "Why?" you would ask at once,

withholding your acquiescence until the answer came: "Because he is so dissipated and extravagant." Once in possession of this clue, however, you can follow the train of reasoning from its starting-point to its goal. The major premise you have already established for yourself inductively:

I. "All young men who are dissipated and extravagant cause their parents great anxiety."

Your friend has asserted the minor premise, and you accept it on his authority.

II. "This young man is dissipated and extravagant." Having, therefore, followed the process of reasoning so far, you are bound to arrive at the conclusion:

III. "This young man causes his parents great anxiety."

The acceptance of the major and the minor premises compels the acceptance of the conclusion.

We have thus traced the course of a simple deductive argument. It consists merely in making entrance into the hearer's mind for the major and the minor premises of the syllogism whose conclusion one wishes to implant. These once admitted, the conclusion is thereby allowed. But the process of gaining admittance for the major and the minor premises may be far less simple than in the case just cited. Let us suppose an argument considerably more complicated. You set out, we will say, to convince a friend that one particular student in college whom you have especially noticed is homesick. Simply to assert this conclusion will not establish it in your friend's mind. You will need to introduce it by the train of reasoning which has previously led you to the conclusion. Perhaps you think this student is homesick because he is a fresh-

man and you have noticed that all freshmen are homesick. In that case you would need only to convince your friend that all freshmen are homesick and that this student is a freshman, to insure the acceptance of the conclusion.

But it may be that your friend has not noticed that all freshmen are homesick, or, perhaps, although ready to grant this generalization, he doubts that this student is a freshman. In either of these cases it will be necessary to establish these propositions before your friend can possibly arrive at your conclusion, that this student is homesick.

If he doubts that all freshmen are homesick, you must convince him by citing, one after another, such facts as have led you to this conclusion. You may remind him that he himself, when a freshman, was homesick; that you were also homesick during your first year at college; that half a dozen other freshmen in your class were homesick; and so was your cousin in the next year's class, and your brother the year after that; your father has owned that he was homesick in his first year at college, and your sister and her friends were victims of the same malady. In this year's class at your own college the freshman at your own table is homesick, and the three who room across the hall from you, and the freshman who lives in your own town, and the freshman next to you in the glee club, and half a dozen others known both to your friend and to yourself.

The major premise of the syllogism you wish to introduce into the mind of your friend is thus established. But if the minor premise demands support before the hearer is inclined to admit it, you must devise some method of making entrance for it also into his mind. The method by which it obtained credence with you will doubtless at once suggest itself. How have you come to the conclusion that this student is a freshman? Possibly

through the faith that all students who have never been in college before are freshmen, and the belief that this student has never been in college before. This implies a syllogism supporting the minor premise of your first syllogism, and running somewhat as follows:

- I. All students who have never been in college before are freshmen.
- II. This student has never been in college before.
- III. This student is a freshman.

Perhaps your friend is ready to admit the truth of both the major and the minor premises of this second syllogism, which means that he has already come to each of these conclusions himself; but in case he has not done so, it will be necessary to induce him to do so, by proving either the major premise or the minor, or both. The major premise is readily established by citing several instances in which students who are known never to have been in college before have been assigned to the freshman class. The minor premise, however, needs a different method of proof. What has led you to suppose that this student has never been in college before? Perhaps it is that he seems ignorant of certain typical college usages or terms. If your friend asks, "How do you know he hasn't been in college before?" you will be likely to answer at once, "Why, he doesn't know what 'cut' means." Your reasoning here might be represented by the following syllogism:

- I. All students who don't know what "cut" means have never been in college before.
- II. This student doesn't know what "cut" means.
- III. This student has never been in college before.

If your friend admits these premises, he is of course

bound to accept the conclusion; but he may perhaps go so far as to question the minor premise. "Are you sure," he asks, "that this student doesn't know what 'cut' means? What makes you think he doesn't?" And to this inquiry you can only answer, "He looked perfectly bewildered when I said something about having a 'cut' yesterday." Your implied argument might be syllogized as follows:

- I. All students who look bewildered when one speaks of a "cut," don't know what "cut" means.
- II. This student looks bewildered when one speaks of a "cut."
- III. This student doesn't know what "cut" means.

The train of reasoning which underlies such an argument as this is evidently far more complicated than any which we have previously analyzed; or, to state the case perhaps more truly, the attempt to reproduce it in the mind of another person has brought to light its involved structure. We have been compelled to dig below the major and the minor premises which lead directly to the conclusion, and disclose their hidden foundations, the reasoning processes which support them as they support the ultimate conclusion. We have thus been brought to recognize several orders in a train of reasoning, that part of the train which leads directly to the conclusion being of first importance, those parts which support any element in the first order ranking second in importance, and so on to the order furthest removed from the conclusion. Should we letter these orders, to distinguish them one from another, we should mark with the letter A the syllogism leading to the conclusion "This student is homesick"; with the letter B the trains of reasoning establishing the conclusions "All freshmen are homesick" and

“This student is a freshman”; with the letter C the arguments proving that “All students who have never been in college before are freshmen,” and that “This student has never been in college before”; and with the letter D the reasoning supporting the conclusion “This student doesn’t know what ‘cut’ means.” The complete analysis of the train of reasoning underlying this argument would, then, be as follows:

- A. I. All freshmen are homesick.
- II. This student is a freshman.
- III. This student is homesick.
- B. I. What is true of (say) fifteen freshmen is true of all freshmen.
- II. 1. One freshman is homesick.
- 2. Another freshman is homesick.
- 3. A third freshman is homesick, etc.
- III. All freshmen are homesick.
- B. I. All students who have never been in college before are freshmen.
- II. This student has never been in college before.
- III. This student is a freshman.
- C. I. What is true of (say) twenty students who have never been in college before is true of all students who have never been in college before.
- II. 1. This student who has never been in college before is a freshman.
- 2. Another student who has never been in college before is a freshman, etc.
- III. All students who have never been in college before are freshmen.
- C. I. All students who don’t know what “cut” means have never been in college before.

- II. This student doesn't know what "cut" means.
- III. This student has never been in college before.
- D. I. All students who look bewildered when one speaks of a "cut," don't know what "cut" means.
- II. This student looks bewildered when one speaks of a "cut."
- III. This student doesn't know what "cut" means.

Such a complex structure as this we find in the majority of arguments. Seldom is an argument represented by a single syllogism whose major and minor premises are both accepted unquestioningly by the hearer. Usually one or both of the premises leading to the conclusion of an argument must be supported by subsidiary arguments. The necessity of such support gives rise to what we may call the complex structure of an argument, taking the name from the complex sentence in grammar. Such structure has been sufficiently illustrated by the argument establishing the conclusion that this student is homesick. Here only one syllogism of primary importance appears, all the other syllogisms depending either directly or indirectly upon it.

A different type of structure is exemplified by such an argument as the following. Imagine, for instance, that one wishes to establish in the mind of another person the conclusion, "The Ajax is a good make of wheel." It may seem to him at first thought that he has had only one reason for coming to this conclusion, but when he wishes to induce another person to the same conclusion half a dozen cogent reasons define themselves in his consciousness. He believes it a good make of wheel perhaps because his friend Field, a judge of bicycles, considers it so. This judgment is, however, corroborated by the facts

that it is made by a reliable house, that it costs a fair price, that it is guaranteed for a certain time, that it has a good reputation among wheelmen generally, and that its mechanism seems both simple and strong. Each of these reasons might be separately syllogized as follows:

(1) I. All makes of wheel that Field commends are good.

II. The Ajax is a make that Field commends.

III. The Ajax is a good make of wheel.

(2) I. All makes of a reliable house are good makes of wheel.

II. The Ajax is a make of a reliable house.

III. The Ajax is a good make of wheel.

(3) I. All makes of wheel that cost a fair price are good makes of wheel.

II. The Ajax is a make that costs a fair price.

III. The Ajax is a good make of wheel.

(4) I. All makes of wheel that are guaranteed for a certain time are good makes of wheel.

II. The Ajax is a make that is guaranteed for a certain time.

III. The Ajax is a good make of wheel.

(5) I. All makes of wheel that have a good reputation among wheelmen generally, are good makes of wheel.

II. The Ajax has a good reputation among wheelmen generally.

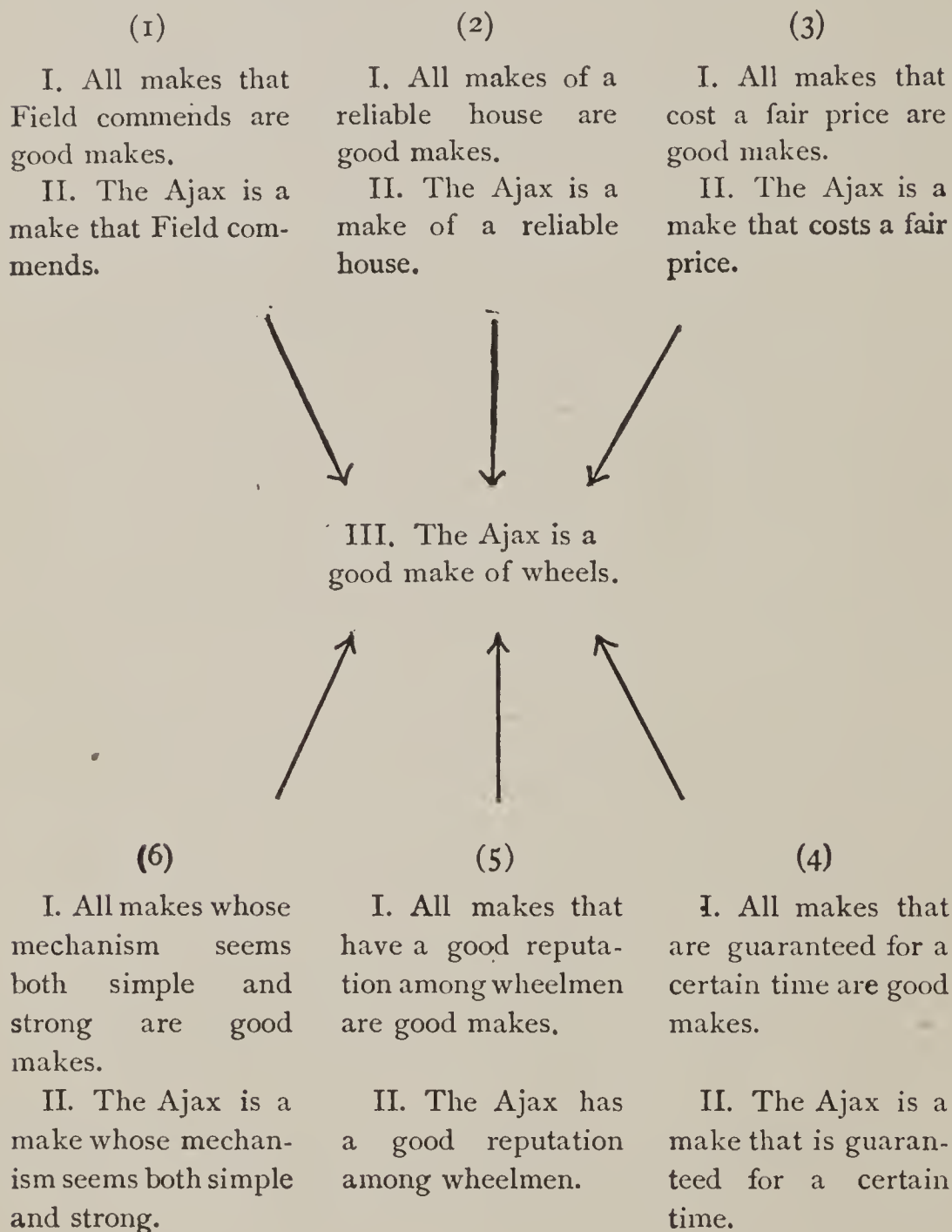
III. The Ajax is a good make of wheel.

(6) I. All makes of wheel whose mechanism seems both simple and strong are good makes of wheel.

II. The Ajax is a make of wheel whose mechanism seems both simple and strong.

III. The Ajax is a good make of wheel.

Here we have six different reasoning processes all leading to the same conclusion. Their relations to each other might be represented by such a diagram as the following, in which all the trains of reasoning converge toward the common conclusion.



Each of these six processes of reasoning is independent of all the others. Each pursues its way to the conclusion without reference to any other. Each is a train of reasoning of primary importance to the conclusion, leading to it directly. If we wished to indicate their respective orders, then, as we did in the complex argument before analyzed, we should be obliged to letter each of the six syllogisms A. This type of argument we may term the compound type, after the analogy of the compound sentence, which is also made up of a group of co-ordinate elements.

We have, then, these two main types of structure for deductive argument, the complex and the compound. The complex deductive argument consists of a single syllogism which leads to the ultimate conclusion of the argument, with a series of dependent syllogisms supporting, either directly or indirectly, some member of the primary syllogism. The compound deductive argument consists of two or more co-ordinate syllogisms, each leading to the same conclusion. These two types may be combined, as when a compound argument is made up of several complex arguments. Thus the argument to prove that the Ajax is a good make of wheel might need to strengthen any one of its constituent syllogisms by supporting either its major or its minor premise. Thus the argument would become an aggregate of co-ordinate arguments, each complex in structure.

We have thus considered the method by which a deductive conclusion is established in the mind of another person. If, however, one should wish rather to dislodge such a conclusion, a different problem is presented us. Let us suppose the case* in which a classmate says to

* Cited in Chapter I.

you, "Fred Ostrander is a good fellow to put in for treasurer of the class." You may be inclined to accept this statement, thinking well of Fred Ostrander and having no decided preference for any other candidate. If, however, you are strongly of the opinion that Fred Ostrander ought not to be elected treasurer of the class, and that John Olsen ought, you will doubtless attempt to displace from your classmate's mind his belief that "Fred Ostrander is a good fellow to put in for treasurer," in order to make room for the conclusion that John Olsen ought rather to be chosen for that office. Let us inquire what methods are open to you in this case.

When the refutation of inductive argument was in question, we noted two ways in which a conclusion might be overthrown: directly, by disproving the facts on which it rested, and indirectly, by establishing a contradictory conclusion. It may be that we shall find these two methods available also for the refutation of deductive argument.

When one of your classmates asserts that "Fred Ostrander is a good fellow to put in for treasurer," you are altogether likely to reply, "I don't think so at all. He would be a very poor candidate. He hasn't the smallest notion of business." This is plainly an attempt at the indirect method of refutation. You do not directly attack the foundations of your opponent's belief, but endeavor to establish a conclusion directly antagonistic to his—the conclusion that Fred Ostrander is a poor candidate for class treasurer. This conclusion you support by the following premises: "Boys who have no business ability are poor candidates for the treasurership of our class," and "Fred Ostrander has no business ability." It may be, however, that this new conclusion will not be

able unaided to dislodge the old one from the mind of your opponent, who mutters defiantly: "Well, anyhow, he's a first-rate fellow and the boys want to give him an office." Upon this you are doubtless moved to retort, "I don't call a cad like Ostrander, who cribs all his prose exercises, a 'first-rate fellow.' And I'd like to know who 'the boys' are who want so much to give him an office. Jim Weaver and Roy Martin, probably. But the class isn't yearning in that direction, I can tell you." Here you have instinctively made use of the direct method of refutation.

The syllogism implicit in one of your classmate's arguments might be formulated as follows:

- I. All first-rate fellows are good candidates for treasurer of our class.
- II. Ostrander is a first-rate fellow.
- III. Ostrander is a good candidate for treasurer of our class.

The conclusion of this syllogism you undertake to refute by destroying the minor premise. If Ostrander is not a first-rate fellow, it is evident that the conclusion cannot stand. And you attempt to show that he is not a first-rate fellow, by arguing that fellows who crib their Latin prose are not first-rate fellows, and that Ostrander does this. Thus you have refuted the conclusion that Fred Ostrander is a good candidate for treasurer of the class, so far as this conclusion is dependent on the syllogism, whose minor premise is "Fred Ostrander is a first-rate fellow."

But you have still to overthrow the same conclusion, as supported by the premises "All fellows to whom the class wishes to give an office are good candidates for treas-

urer," and "Fred Ostrander is a fellow to whom the class wishes to give an office." The method of refutation is here as it was before, the overthrow of the minor premise. "Fred Ostrander is not a fellow to whom the class as a whole wishes to give an office," you assert. This assertion will doubtless need proof, which you can supply by citing the statements of several representative members of the class to the purport that they, individually, do not wish to give Fred Ostrander an office. Having thus established inductively the conclusion that the class as a whole does not wish to give Fred Ostrander an office, you have disproved the minor premise of your opponent's syllogism and hence the conclusion which rests upon it.

You might, if you had chosen to do so, have destroyed the conclusion of your antagonist by discrediting the major rather than the minor premises of his argument. "All first-rate fellows are not necessarily good candidates for the treasurer of our class," you might argue; and "All fellows to whom the class wishes to give an office are not invariably good candidates for treasurer of our class." Or, if you wished, you might have disproved both the major and the minor premise of each syllogism. To withdraw from the conclusion either one of its supports is, however, sufficient to cause its fall. If both premises are discredited, the overthrow may be more complete, but is not more certain.

It will be noted that in disproving the major or the minor premise of a syllogism, either the direct or the indirect method of refutation may be used. These premises are themselves, as we have lately discovered,* the outcome of certain trains of reasoning, and hence may be overthrown by any method suitable for refuting a conclu-

* See pp. 82-86.

sion. Thus, in disproving the minor premise, "Fred Ostrander is a first-rate fellow," one might show either that the foundations of this belief are false, and hence the belief itself cannot stand, or that the contradictory conclusion, "Fred Ostrander is not a first-rate fellow," is true, wherefore the original statement cannot be true. Either the direct or the indirect method of refutation, or both, may, then, be used to disprove any premise of a deductive syllogism.

But besides the discrediting of one premise in a deductive syllogism, there is another method of withdrawing its supports from a given conclusion. Sometimes one may directly disprove a conclusion whose premises are, taken as isolated propositions, impossible to controvert. This possibility is illustrated by the following syllogism:

- I. All sophomores study history. —
- II. This student studies history.
- III. This student is a sophomore.

The conclusion here is evidently untrustworthy, but not because either the major or the minor premise is false. Each of the premises may be granted true. All sophomores do take history and this student also takes history, but it does not therefore follow that he is a sophomore. Somewhere in the logical process there is a flaw which lays the conclusion open to refutation, though not on the ground of the falsity of either premise.

Before we discuss this defect in the argument, however, let us summarize our previous conclusions as to possible methods of refutation. Deductive argument, we have found, may be refuted by either the direct or the indirect method. The indirect method, as in the case of induction, is that of establishing a conclusion contradicting

that to be overthrown. The direct method consists in demonstrating the falsity of the conclusion to be overthrown, by revealing some defect in the syllogism of which it is the issue. Such a defect is technically called a fallacy. We may pause at this point to define the term. A fallacy is any imperfection in reasoning which invalidates its conclusion, whether that imperfection rests in the logical process itself or in the correspondence of any of its data with fact. A fallacy of the second sort is called a material fallacy, since it has to do with content or material rather than with form; a fallacy of the first kind is termed a logical fallacy, because it is a defect in the reasoning process rather than in the subject-matter. The essential difference between these two species of fallacy may be further defined by the statement that where a logical fallacy is involved, the conclusion does not legitimately follow from the premises, hence it fails to establish itself; while a material fallacy exists when, although the conclusion follows legitimately from the premises, at least one of the premises is false, and hence the conclusion must be discredited.

Direct refutation of a deductive argument consists, then, in revealing a fallacy in the argument; this fallacy being either material or logical. Material fallacies can be detected only by exact analysis of the argument of an opponent and sharp scrutiny of its premises to see whether they are in themselves true propositions. The discovery of logical fallacies in an opponent's argument may be aided by the study of the chief types of logical fallacy.

These are four in number, if we restrict ourselves to the varieties most likely to be encountered: (1) the undistributed middle, (2) the illicit process of either major or minor term, (3) *ignoratio elenchi*, or the irrelevancy of the

premises, and (4) *petitio principii*, begging the question, or arguing in a circle, as it is variously called.

The fallacy of the undistributed middle consists in the failure of the major premise to perform its function in the syllogism, namely, the complete inclusion of the middle term in the major, as in the following syllogism:

- I. Some uneducated men are successful lawyers.
- II. This man is an uneducated man.
- III. This man is a successful lawyer.

Here the middle term "uneducated men" is partly included in and partly excluded from the major term "successful lawyers." Not all uneducated men belong to the class of successful lawyers; only some of them do. And whether this particular uneducated man belongs to that portion of the class of uneducated men who are successful lawyers; or to that portion who are unsuccessful lawyers, or good teamsters, or poor tailors, or excellent street-venders, or admirable factory hands, or what not, cannot be declared on the basis of the major premise, "Some uneducated men are successful lawyers."

The form of syllogism in which this fallacy openly appears has been previously discussed,* so that we need not now dwell longer upon it. We shall need, however, to examine one of its less overt manifestations, as in the syllogism suggested some pages back.†

- I. All sophomores study history.
- II. This student studies history.
- III. This student is a sophomore.

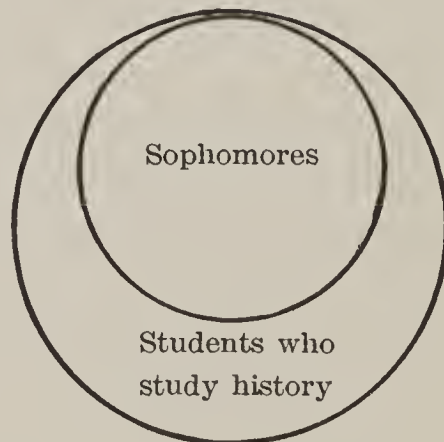
At first one only feels dimly that there is something

* See Chapter IV., p. 67.

† Page 93.

wrong with this syllogism. When, however, he examines it closely, he notes that the middle and the major terms have changed their accustomed places in the major premise. From the conclusion he knows that the major term is "sophomores." He would therefore expect to find the major premise "All students who study history are sophomores." But instead it reads "All sophomores are students who study history." That is, instead of the major term's including the middle, the middle includes the major. And we have such a diagram as this:

Major premise:



If we had set out to reach the conclusion "This student studies history," this major premise would answer our purpose. But we cannot draw the conclusion that this student is a sophomore merely because all sophomores study history and this student also studies history. As Mr. Fowler says of such reasoning, "We might argue quite as legitimately that, because both men and cats are animals, all men are cats!"* Or, to parallel more

* *Deductive Logic*, p. 144.

closely the syllogism under discussion, we are equally entitled to believe that because all hens are bipeds, and John Jones is a biped, therefore John Jones is a hen. The major premise in each of these cases, instead of including the middle term in the major, includes the major in the middle term. This means, of course, that a part only of the middle term falls within the major, a large portion of the middle extending out on every side of the major.* When one says that all sophomores take history, one says virtually that some people who take history are sophomores. Other students may also study history; all we know from the premise is that some of the people who study history in a certain college are sophomores.

If the premise be framed in this way, it is easy enough to see that this case falls under the fallacy of the undistributed middle. Not all the middle term is included in the major—only some people who study history are sophomores—hence the minor term, this particular student, although belonging somewhere in the class of people who study history, cannot certainly be adjudged to fall in that particular portion of the class of people who study history which is coincident with the class of sophomores.

The term “undistributed middle” is perhaps somewhat misleading, inasmuch as distribution commonly implies to us the division of the object distributed and the assignment of various parts of it to different quarters. This meaning of the word must be wholly set aside in using the term logically, for here “distribution” signifies simply the assignment of one whole term or class of things to another. The middle term is said to be “distributed”

* See diagram, page 96.

when the whole class which it represents is included within the major; undistributed, when only a part of it is so included. Hence the fallacy of the undistributed middle consists, as was said at the beginning, in the failure to assign the whole of the middle to the major term.*

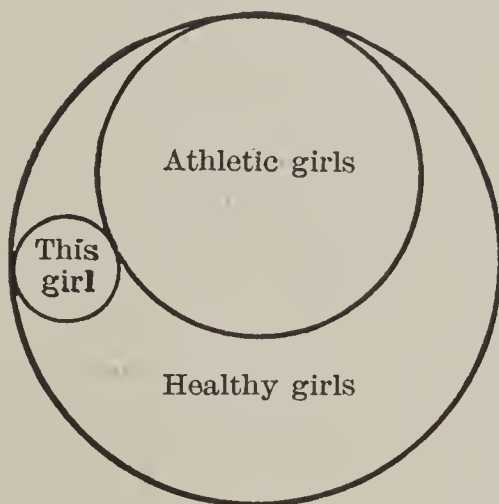
A second form of logical fallacy which very easily escapes detection is that called the illicit process of either the major or the minor term in a syllogism. The conclusion of a syllogism may, we have seen, be invalidated because of a certain failure on the part of the middle term. The same result, we shall see, may come about when either the major or the minor term is at fault. In this case the erring term appears in the conclusion in a form essentially different from that which it bore in the major or minor premise. This difference may be one of quantity or of quality. The minor term, which in the minor premise was particular, or undistributed, appears in the conclusion as universal, or distributed. Or, the major term, affirmative in the major premise, becomes negative in the conclusion. For instance, one argues that because all athletic girls are healthy and this girl is not athletic, therefore this girl is not healthy. A moment's thought brings the fallacy to light. All athletic girls may indeed be healthy, but so are some girls who are not athletic. The fact that this girl is not included in the small class of athletes is no proof that she may not fall somewhere in the larger class of healthy girls, which class embraces and

* One does not commonly hear of the undistributed minor term, yet it is evident that this also may be distributed or undistributed with reference to the middle. That is, it may be wholly or only partly included in the middle term. But since the location of the minor term does not serve to fix that of any other term, the importance of its distribution or non-distribution is comparatively small.

surrounds the class of athletes.* The major term, which in the major premise was “girls who are healthy,” has, in the conclusion, suddenly become transformed into the term “girls who are not healthy,” representing the class to which this particular girl is forthwith assigned. To redeem this fallacy, the major premise, instead of being “All athletic girls are healthy,” must become its converse, “All girls who are not athletic are not healthy,” from which, with the minor premise, “This girl is not athletic,” follows legitimately the conclusion “This girl is not healthy.”

The syllogism as first presented, involved the illicit process of the major term. This fallacy is not, however, usually so patent as in the syllogism which we have discussed, but is more often veiled in some such statement as the following: Any calling that demands all a man's energies in return for a bare subsistence limits his mental growth. None of the learned professions demand all a

* Note the diagram :



This particular girl may fall, as represented, within the class of healthy girls, though not included in the class of athletic girls.

man's energies in return for a bare subsistence; hence none of the learned professions limit a man's mental growth. To detect a fallacy in such a case as this it is necessary first to attempt to reduce the argument to the typical form of the syllogism, as follows:

- I. Callings which demand all a man's energies in return for a bare subsistence limit his mental growth.
- II. The learned professions do not demand all of a man's energies in return for a bare subsistence.
- III. The learned professions do not limit a man's mental growth.*

When thus formulated, the change of the major term, from an affirmative quality in the major premise to a negative quality in the conclusion, becomes evident.

A similar change may take place in the minor term, so that it comes in the conclusion to be a larger or a smaller, or in some way a different term from that which it was in the minor premise; as for instance, when it is reasoned that all Byron's poems must be uninteresting because some of them are long and all long poems are uninteresting. This change of the minor term from a particular to a universal is so patent that it seems quite unlikely to occur in serious reasoning; but it often appears in such typical arguments as the following: "I won't ask another literary lion to my receptions. Some of them are so rude, and rude people I will not countenance, no matter how famous they are." The conclusion that all literary lions belong to the class of rude people whom the speaker will not countenance, following from the minor premise that

* The student should diagram each of the fallacious syllogisms discussed in the chapter.

some literary lions are rude, exhibits again a transformation of the minor term from particular to universal.

It is plain that this fallacy of the illicit process, either in major or in minor term, results from failure to observe the law* that each term should be phrased in precisely the same way throughout the syllogism. If care is taken to obey this regulation strictly, the fallacy of the illicit process becomes impossible.

The fallacy of *ignoratio elenchi* or irrelevancy consists in arguing toward a conclusion other than the one to be established; as when one girl asserts that Annie Brown ought really to leave school—she can never pass her examinations; and another cries ecstatically, “Oh, but she does her hair so divinely!” This is a crude case of the irrelevant argument, but it shows the same incongruity between premises and conclusion as is exhibited in the subtler forms, where, “For instance, instead of proving that ‘this prisoner has committed an atrocious fraud,’ you prove that ‘the fraud he is accused of is atrocious’; instead of proving (as in the well-known tale of Cyrus and the two coats) ‘that the taller boy had a right to force the other boy to exchange coats with him,’ you prove that ‘the exchange would have been advantageous to both’; instead of proving that ‘a man has not the right to educate his children or to dispose of his property in the way *he thinks best*,’ you show that the way in which he educates his children or disposes of his property is not *really the best*; instead of proving that ‘the poor ought to be relieved in this way rather than in that,’ you prove that ‘the poor ought to be relieved.’ ” †

* See page 62.

† Whately, *Elements of Logic*, Bk. III., *Of Fallacies*, § 15. See also Fowler, *Deductive Logic*, p. 149; Jevons, *Lessons in Logic*, p. 178, etc.

This fallacy is variously classified with material and with logical fallacies; but it should doubtless fall into the latter category. The premises may be quite true in themselves, but between them and the conclusion which the reasoner expects to attain by means of them there is a great gulf fixed. They lead to a conclusion, indeed, but not to the one aimed at. There is, then, a flaw in the reasoning process itself—a hiatus, a lack of correspondence between premises and conclusion. These premises do not logically issue in this conclusion, however insistently they may be urged as proofs of it.*

The discovery of this fallacy depends, it is evident, upon such a careful analysis of the opponent's argument that the exact relation of every argument to the ultimate conclusion becomes plain, together with any lack of relation, if such there be. Once detected as contributing to a conclusion other than the one it assumes to support, an opponent's argument is speedily set aside.

That fallacy known as *petitio principii*, begging the question, or reasoning in a circle, is a fallacy in which not one syllogism, but a complex of syllogisms is concerned. Where this fallacy occurs, the ultimate conclusion of the argument is supported by a premise which the conclusion itself has previously aided in establishing. A popular instance of such fallacy is the case in which one is urged to vote with the Republican party because its platform is sound, the soundness of its platform being demonstrated by the fact that it is avowed by the Republican party.

* Whately and Jevons call this fallacy that of the "Irrelevant-Conclusion," but it is perhaps quite as truly the premises that are irrelevant. The arguer aims, indeed, at the conclusion demanded by the situation. The premises by which he attempts to reach it are, however, essentially unrelated to it, and hence incapable of establishing it.

The circular course of the reasoning is here sufficiently evident, as it is in the following argument: "Love of virtue must be innate in men, for otherwise it would not be, as it is, universal. It is not necessary to prove the universality of this passion, for it springs up untaught in the hearts of all men with the very beginnings of intelligence."

In this last reasoning, the ultimate conclusion, that the love of virtue is innate, is supported by the premises, "All qualities that are universal are innate," and "The love of virtue is universal"; but to prove this minor premise, it is alleged that all qualities which are innate are universal and that the love of virtue is innate—the ultimate conclusion thus serving as the minor premise to support the minor premise which supports the ultimate conclusion.* Such a circular process of reasoning is usually disguised by a longer series of dependent syllogisms, but when analyzed out the same return upon itself is observed as in the illustrations given.†

To point out a fallacy in the argument of an opponent is, as we have seen, to discredit the conclusion of that argument. It is, therefore, of the greatest importance for refutation that the student should be able readily to detect fallacies, whether material or logical, in the reasoning of another person. While remembering this, however, it should not be forgotten that the same readiness aids also, when directed against the student's own arguments, in rendering them proof against attack. The student will do well, after formulating any argument, to attempt its refutation by every means in his power. This will reveal to

* The student should write out the two syllogisms and see clearly their exact relation to each other.

† Further illustrations may be found in Whately, *Elements of Logic*, Bk. III., § 13.

him its weak points and enable him to strengthen them before an opponent can anticipate him.

In concluding the subject of deductive refutation, it should be said that here, as with induction,* both the direct and indirect methods should, if possible, be used. One is seldom quite sufficient without the other, though some arguments lend themselves to one much more readily than to the other. To show that because of some fallacy in the reasoning, either material or logical, the conclusion of your opponent cannot stand, and then that the contradictory conclusion is true, constitutes the most complete and effective method of refutation.

EXERCISES.

1. Analyze completely, lettering the various orders, the reasoning process underlying each of the following arguments. Criticize the structure of each in the light of this analysis.

(a) The importance of Hawaii lies in the fact that it is a stopping-place in a great waste of waters. It is a rendezvous for coal and supplies of all kinds for those who go down to the sea in ships. We have now, and have had from the earliest times, every facility of this nature that we could possibly desire. If we had owned the islands, we could not have had greater privileges there, although our responsibilities would have been greater. In fact, Americans have governed the islands during most of the time since we have had possession of the Pacific coast. We have been spared the trouble of fortifying them and keeping a large naval force in those waters and settling their private quarrels. Since 1875, we have had a treaty with the islands which expressly forbids them to grant any lien,

* See Chapter III., pp. 32-3.

power, or control over any part of their territory to any other government. But if there had been no such treaty, we should still have forbidden any such lien, power, or control. As other nations have respected our wishes in the matter in the past, they would respect them in the future, all the more as our power to command respect increases with revolving years. The situation heretofore has been exactly to our liking, and we may well ask why it should be changed.—*Nation*, 56:75.

(b) It is safe to suppose that one half of the talk of the world on subjects of general interest is waste. But the other half certainly tells. We know this from the change in ideas from generation to generation. We see that opinions which at one time everybody held became absurd in the course of half a century—opinions about religion and morals and manners and government. Nearly every man of my age can recall old opinions of his own, on subjects of general interest, which he once thought highly respectable, and which he is now almost ashamed of having ever held. He does not remember when he changed them, or why, but somehow they have passed away from him. In communities these changes are often very striking. The transformation, for instance, of the England of Cromwell into the England of Queen Anne, or of the New England of Cotton Mather into the New England of Theodore Parker and Emerson, was very extraordinary, but it would be very difficult to say in detail what brought it about, or when it began. Lecky has some curious observations, in his *History of Rationalism*, on these silent changes in new beliefs *apropos* of the disappearance of the belief in witchcraft. Nobody could say what had swept it away, but it appeared that in a certain year people were ready to burn old women as witches,

and a few years later were ready to laugh at or pity any one who thought old women could be witches. "At one period," says he, "we find every one disposed to believe in witches; at a later period we find this predisposition has silently passed away." The belief in witchcraft may perhaps be considered a somewhat violent illustration, like the change in public opinion about slavery in this country. But there can be no doubt that it is talk—somebody's, anybody's, everybody's talk—by which these changes are wrought, by which each generation comes to feel and think differently from its predecessor. No one ever talks intimately about anything without contributing something, let it be ever so little, to the unseen forces which carry the race on to its final destiny. Even if he does not make a positive impression, he counteracts or modifies some other impression, or sets in some train of ideas in some one else, which helps to change the face of the world. So I shall, in disregard of the great laudation of silence which filled the world in the days of Carlyle, say that one of the functions of an educated man is to talk; and of course he should try to talk wisely.—E. L. Godkin: *The Duty of the Educated Man. Forum*, 17 : 50.

(c) That a suspected law-breaker can do harm to the community while in jail is not generally supposed. He is thought by most people who give the matter a thought, simply to eat, sleep, and wait until his trial comes off, and if convicted of an offense punishable by imprisonment in jail, to eat, sleep, and wait his turn out. Some few persons suppose perhaps that he regrets, repents, and resolves to break the laws no more. These are all grave mistakes. In jail a prisoner is either teaching, learning, or plotting mischief. If he chances to be an old offender, he loves to recount his dangers, escapes, and successes;

tell stories of magnificent crimes perpetrated by himself or his acquaintances, how they were accomplished, and paints the allurements connected with them in glowing colors. As in the old Sunday-school books the good 'boy always died and the bad one survived, so with his stories, the "cop," detective, and judge are outwitted and the smart and tricky hero goes free and bags the boodle. Many a young man, arrested as a tramp or for some petty misdemeanor, through such influence is lured on to a life of crime.—Levi L. Barbour: *Jails and Prisons*.

(d) Again, as the malefactor is sent to prison to protect society from his depredations, he should be held so long, and only so long, as imprisonment for protection is necessary. That is the way we manage an insane man and protect society from him. A man is sent to the hospital in a like way. He is not sentenced to an insane asylum or a hospital for sixty days or ten years, according to the gravity of his malady. He is kept there so long as his ailments require, and when restored to soundness he is restored to act his own volition, and to society. This is the only reasonable and logical position the State can occupy when it assumes to deprive a man of his liberty. The idea that the state punishes for the sake of avenging a wrong is absurd. The state is not directly injured when Peter robs Paul. . It is directly injured only in cases of treason, smuggling, bribing public officers, squandering the public domain, and the like public wrongs. The object of the state is not vengeance, not to inflict suffering, not to get even for the offense committed.—Levi L. Barbour: *Jails and Prisons*.

2. Fix in your own mind upon some person whom you would like to convince of the truth of one of the following conclusions. Plan out the argument by which you will

attempt to establish the conclusion in his mind, setting down the syllogism which leads directly to the conclusion, and all syllogisms which seem to you necessary to establish any member of the primary syllogism, lettering each syllogism so as to show its relation to the conclusion you wish to establish. Then write the argument, analyzing it after you have finished and noticing in what respects your analysis differs from your plan.

(a) Bicycle paths should be constructed at public expense.

(b) Night schools should be maintained by all large cities.

(c) The education of girls should be different from that of boys.

(d) The summer vacation should be shortened.

(e) Examinations should be done away with.

(f) Arctic exploration does not pay.

(g) Rich women (or men) have no right to hold business positions.

3. Determining upon a hearer as in Exercise 2, write a compound argument, inducing your hearer to accept one of the following conclusions by urging as many reasons as you can for believing in its truth. Plan the argument before writing it, and analyze it when it is finished.

(a) Smoking (chewing gum, eating rapidly, using slang, or any similar habit) is a bad habit.

(b) Children (age limited in any way desired) should be given a regular allowance for pocket-money.

(c) The Santa Claus myth should not be told to children.

(d) High-school commencements ought to be abolished.

(e) Cheating in examinations is wrong.

(*f*) The practice of "tipping" should be discountenanced in this country.

4. Choose any deductive argument which you have already written, and, viewing it impartially as if it had been written by another person, refute it as completely as you can. State at the end the methods you have used.

5. Report any argument and its refutation which you have lately heard in conversation. What method of refutation was used? How successful was it? Could you have made the refutation stronger or more complete? How? Could you have refuted the refutation? How?

6. Find the refutation of some argument in one of your text-books (excluding text-books of logic and of argumentation). Note the methods used. Is the refutation conclusive? If not, how could it be made so?

7. Choose a subject for deductive argument on which you feel strongly but have never before written. State clearly the conclusion toward which you argue, and support this conclusion as strongly as you know how. Then exchange arguments with another member of the class who has defended a different conclusion (preferably one bearing on quite another subject), and, after carefully analyzing his argument, refute it thoroughly.

8. Point out and name all the fallacies involved in the reasoning underlying the following actions or arguments, first reducing the reasoning to syllogistic form.

(*a*) The maid, in putting a room to rights, laid a spool of "dental floss" in the work-basket among the sewing-spools.

(*b*) Mathematical study undoubtedly improves the reasoning powers, but as the study of logic is not mathematical study, we may infer that it does not improve the reasoning powers.

(c) Colonel Alexander Gardner, during a stay in Asia, was suspected of being a Russian spy. The Khan of Khiva deputed three learned men who had traveled over half the world to determine this point by examining him. This is the abstruse and terrific examination with which they were satisfied. "What are you?" they asked. "An American." Still they were suspicious; and one man, a very enlightened scholar, offered as a crowning test, this deep and conclusive geographical question: "Could you go by land from America to England?" "No," was the prompt reply, and the questioner, as much delighted at his own superior learning as at the traveler's integrity, declared that he was convinced. This was an American indeed.—*Youths' Companion*, Oct. 27, 1898. From Col. Alexander Gardner's *Soldier and Traveller*.

(d) If our rulers could be trusted always to look to the best interests of their subjects, monarchy would be the best form of government; but they cannot be trusted; therefore monarchy is not the best form of government.

(e) "How do you know you're mad?" (asked Alice).

"To begin with," said the cat, "a dog's not mad. You grant that?"

"I suppose so," said Alice.

"Well, then," the cat went on, "you see a dog growls when it's angry and wags its tail when it's pleased. Now, *I* growl when I'm pleased, and wag my tail when I'm angry. Therefore I'm mad."—Lewis Carroll: *Alice in Wonderland*.

(f) "Two days wrong," sighed the hatter [looking at his watch]. "I told you butter wouldn't suit the works!" he added, looking angrily at the March Hare.

"It was the *best* butter," the March Hare meekly replied.—Lewis Carroll: *Alice in Wonderland*.

(g) All journalists of the 'yellow' school attacked the measure vigorously. This writer could be at once classified as belonging to the 'yellow' journalists, because his article strongly opposed the measure.

(h) "Dora, my darling!"

"No, I am not your darling. Because you *must* be sorry that you married me, or else you wouldn't reason with me!" returned Dora. Dickens: *David Copperfield*, ch. xlviii.

(i) I'm sure he hasn't a generous disposition, for his ears are so small; and you know the saying is that people with large ears are generous.

2 x x

CHAPTER VI.

A PRIORI REASONING AND ARGUMENT.

HITHERTO we have discussed only that deductive reasoning whose conclusions have reference to the present. We have inferred that a policy of territorial expansion ought to be adopted by the United States now, that Silas Jones is at this writing a poor accountant, or that student government is not at present desirable for a certain college, rather than that a free-silver plank will be inserted in the next Democratic platform, or that the war with Spain was brought about by the sensational newspapers in America. We must now turn, however, to those deductive reasonings which look forward and to those which look backward in time.

The form of deduction by which one is enabled to predict that a certain event will happen in the future because under similar circumstances this event always does happen, is called *a priori* reasoning. The significance of the name will disclose itself in our further analysis of the process.

The basis of *a priori* reasoning is our sense of an unvarying sequence of circumstances or events. The sun will rise to-morrow morning because it rises every morning. My father will not allow me to attend this ball because he never does allow me to attend balls. We have noticed several times that during a storm a flash of light-

ning is followed by a clap of thunder, and by induction establish the sequence: "A flash of lightning during a storm is always followed by a clap of thunder." When, therefore, we see a certain flash of lightning, we listen for the clap of thunder which we expect to follow it. Or, having observed in several instances that a severe frost in the early autumn has been followed by the blighted appearance of garden plants, we conclude that this catastrophe always follows a hard frost, and are thereupon able, if there has been a hard frost, to infer that the plants in the garden will be blighted. All weather-signs involve this process of reasoning. "A red sunset is followed by a fair day," is an induction whence may be derived an *a priori* conclusion as to the weather for to-morrow. "Rain before seven stops before eleven," is often regarded as sufficient basis for an assurance that the coming afternoon will be clear.

Such practical *a priori* judgments as these cited constitute a very large per cent of our every-day inferences. We are called upon almost hourly to determine, if not what the weather is to be, then what result is likely to follow from a certain event or a certain course of conduct, or what a man of a given character will probably do in given circumstances.* In fact, we are obliged to reason in this

* This seems to be a case in which one event does not follow another, but an event or action is caused by a certain disposition or character. We may, however, if we like, reduce this sequence to the typical form by regarding the first member of the series not as the character in question, but as the acquisition or formation of that character, this action being always followed by a certain course of conduct under certain circumstances. Such a view, quite defensible philosophically, has the further advantage of enabling us to throw this case of *a priori* reasoning into the form which serves for the rest.

It may here be noted that the only form which really does cover all

way whenever we attempt to adjust present actions to future ends. If we wish, for instance, to secure exact knowledge of any subject, we determine how to act in order to do so, by referring to a previously noted sequence of events, as unvarying as any in nature. "Intelligent and continuous application to any subject for a sufficient time is followed by exact knowledge of that subject." Having recalled this sequence, we are now enabled to identify its second member with the event desired; and take measures toward securing the first member of the series, sure that the second will follow—because it always does follow the first. Or, if the sequential relation between saving money and having it to spend at a future time be noted, one is able to secure the second member of the series by making sure of the first.

And contrariwise: we often find ourselves able, by the aid of *a priori* reasoning, to avoid an undesirable consequent by forbearing its antecedent. If we don't want the headache, we refrain from eating the rest of the box of candy; if we don't want to be considered illiterate by strangers, we take pains with our business letters; if we don't want a worn-out body, we see to it that the first member of the series—spending more energy than is sup-

varieties of *a priori* reasoning is that which is based upon a sequence of time. The relation of cause and effect (wholly aside from the fact that the philosophers are nowadays assuring us that no such relation exists, events which seem to be so related being in fact only adjacent sections in a continuous movement of things) does not, so far as we know, obtain between such phenomena as those of a red sunset and the fair day which follows. The sunset does not cause the fairness of the ensuing day, though prophesying it. For this reason, as well as for the philosophical one indicated above, it seems best to regard the merely temporal sequence, which includes the casual, as the basis of *a priori* reasoning.

plied—is inhibited. Knowing that one thing always follows another, we can bring about or, within limits,* prevent the second by appropriate action as regards the first.

The typical form of this reasoning may now be outlined as follows: Event A is always followed by event B. This event (or circumstance) is A. Therefore this event (or circumstance) will be followed by B. Syllogistically this process reduces to the following:

- I. All events of class A belong to the class of events that are followed by event B.
- II. This event is an event of class A.
- III. This event belongs to the class of events that are followed by event B.

Or, more simply:

- I. A is followed by B.
- II. This event is A.
- III. This event is followed by B.

The syllogism, it will be noted, does not in its wording involve the future tense. The conclusion says not that this event will be followed by B, but only that this event belongs to the class of events which are always followed

* It is truer to say that one can refuse to incite the second event in the series by forbearing the first. The second may appear in the wake of quite a different event—one may have a headache even if he doesn't eat the rest of the box of candy. But he surely will have a headache if he does eat the candy; that much one is sure of from past experience. In both the positive and the negative uses of *a priori* reasoning to determine action only one means of securing or avoiding the second member is suggested. There are doubtless in each case others, but they involve different series and must be separately considered.

by B.* Strictly speaking, this is the proper form for the conclusion, inasmuch as it retains the original phrasing of the major term. The future implication arises solely from the point of view of the person inferring. Standing as he does at a point of time when event B has not yet appeared, he says naturally, not “B does follow this particular event,” but “B will follow” it. We must, then, though starting with the idea that *a priori* reasoning leads to a future conclusion, recognize the fact that the futurity of the conclusion resides not in its technical form, but in the point of view of the person reaching the conclusion.

The name *a priori* may perhaps be regarded as having reference to the datum given from which the inference is drawn. In *a priori* reasoning the conclusion is reached by inference from an event occurring before the event to be inferred, as in the correlative *a posteriori* reasoning,† the inference is from an event which has occurred after the event to be determined. Both names have significance, then, as indicating the location of the grounds of inference with reference to the event inferred. If these grounds are previous to the event inferred, the reasoning is called *a priori*; if succeeding it, *a posteriori*.

An *a priori* conclusion, like any other conclusion, may

* The fact that *a priori* reasoning is often called reasoning from probability (and the argument based on it argument from probability) doubtless has some relation to the form of the conclusion. This particular event, so the conclusion tells us, belongs to the class of things which are always followed by event B. It will, therefore, probably be followed by event B, though this cannot be predicted with perfect certainty. Like all logical conclusions, that of *a priori* reasoning lacks absolute certitude, and this lack is only emphasized by its future reference. Hence this reasoning, more than any other, may seem to justify the name “reasoning from probability.”

† See Chapter VII.

be introduced into the mind of another person by reproducing in his mind the train of reasoning which has led to it. The sequence must first be established and then the event or circumstance in question must be identified with the first member of the sequence, before the hearer or reader can accept the conclusion that the second member will follow this particular event.

In the refutation of *a priori* reasoning one may use the direct method alone or the direct and the indirect together. One may attack the conclusion directly by destroying the sequence or by showing that the event in question is not identical with the first member of that sequence. Or, having thus discredited the conclusion, he may completely overthrow it by proving that an event quite the opposite will follow the event in question. Thus, if one wishes to dislodge from another person's mind the conclusion that the application of iodine to an aching tooth will be followed by relief, he proves by numerous instances that the application of iodine is not habitually followed by the relief of an aching tooth and, still further, may attempt to establish the fact that such application is usually followed by a more acute aching, and that, therefore, it will be so followed in this particular case. Or, if it is desirable to disprove the conclusion that allowing Robbie to do the thing he has begged to do will be followed by the establishment of the habit of teasing, one may undertake to overthrow, not the impregnable major premise, "Weak yielding to a child's importunities is followed by his acquisition of the habit of teasing," but the more amenable minor, "This is a case of weak yielding to a child's importunities." "Robbie hasn't teased for this," you would say. "He has only asked for it eagerly, as any child would, believing in his parents' desire to give him

pleasure.” And you are yielding not to his request, but to your own sense of what will be for his ultimate advantage as well as for his present gratification. It will do him good to go, and the permission will so establish his faith in your desire for his happiness that he will never think of teasing you for a thing you disapprove of.” In the last sentence, it will be noted, the indirect method of refutation appears. Such a combination of methods of refutation is found in *a priori* as in all other argument to be far more effective than either method alone.

EXERCISES.

1. Syllogize and picture all the illustrations of *a priori* reasoning used in the text. Test the syllogisms.

2. Analyze and reduce to syllogistic form the *a priori* reasoning underlying each of the following actions:

(a) Taking an umbrella when one goes to walk on a cloudy day.

(b) Sending for a doctor when one is sick.

(c) Taking quinine for a cold.*

(d) Stepping carefully over muddy crossings.

(e) Shutting the door of a sick-room softly.

(f) Putting father's slippers to warm before he comes home.

(g) Sighting a gun.

(h) Writing home for more money when funds begin to run low.

(i) Planting seeds of a certain kind in the garden.

3. Analyze completely the reasoning process underlying each of the following arguments* or actions:

* Or a favorite remedy for any other ailment.

† Not only *a priori*, but simple deductive and inductive reasoning will be found in certain of these arguments. The relation of each process to all the others should be carefully worked out.

(a) Every valley shall be exalted, and every mountain and hill shall be made low: and the crooked shall be made straight, and the rough places plain: And the glory of the Lord shall be revealed, and all flesh shall see it together: for the mouth of the Lord hath spoken it.—*Isaiah* 40: 4-5.

(b) Then up and spake an old sailòr,
Had sailed to the Spanish main,
“ I pray thee put into yonder port,
For I fear a hurricane.

“ Last night the moon had a golden ring,
And to-night no moon we see ! ”

H. W. Longfellow: *The Wreck of the Hesperus*.

(c) Mr. John Corbin, writing in *Harper's Weekly*, says that we have been led to expect as a result of the war that our consciousness of national individuality and power would leap forth rejuvenated, and he points to the fact that this rejuvenation must instinctively seek expression in the arts. Thus, he says, that when England destroyed the Spanish Armada the Elizabethan era followed. We have fought and conquered two Spanish armadas; should we not also by rights have a Shakespeare or two?

(d) Mr. Buchanan's new novel, which is to appear in a few days, is to be entitled *Father Anthony*, and is dedicated with affection and respect to a Roman Catholic priest; which tends to confirm me in my belief that Mr. Buchanan will finally enter the Roman Church. I made a prophecy to that effect when Mr. Buchanan was engaged in a controversy with Mr. Le Gallienne, in which he paid a compliment to Christianity by attacking it, while Mr. Le Gallienne dealt it a soft and innocuous blow by attempting to defend it. As every one knows, Mr. Buchanan, who is practically a warm-hearted Christian,

fancies that he is an agnostic. Nature never meant him to be anything of the sort, and sooner or later he will embrace some form of Christianity, and in all probability that form will be the Roman. Nothing is known of Mr. Buchanan's new book except its dedication. It may be presumed that its hero is a Roman priest and that it will be a forcible and readable book.

(e) Seest thou a man diligent in his business? He shall stand before kings.—*Proverbs*, 22 : 29.

(f) Mr. Carnegie said with great earnestness: "If the United States is going to undertake the government of the Philippines and go in for expansion throughout the world, putting her hand in the hornets' nest of European rivalry, there can be no prosperous business. We shall be subject to wars and war's alarms.

"Business is the child of security and peace. The entrance of the United States as a new power in the Far East will set every one of the present powers to a study of the question from a new standpoint. We shall be compelled to increase our navy. We must pay for a large standing army, and there is neither rest nor security for us. Before the American people comes now the most serious issue since the issues of independence and of secession. A false step now and the future of the republic will, in my opinion, be seriously impaired and its industrial career retarded."

"You do not think that territorial expansion will bring expansion in trade?"

"No. Not by any means. The development of one State in the Union in peace and security will outweigh all the increase of profit we can get from foreign trade in any of the worthless possessions which we can attempt now to take. The Philippines have a certain trade which cannot

be greatly increased: the wants of the people are few: barbarians are no customers, civilized people are the consumers for our products."

"Do you think well of the acquisition of Puerto Rico?"

"I certainly do. That is no distant possession. That is on our continent and I approve of its acquisition. I am no little American. The day is coming when we shall own all these West Indian islands. They will gravitate to us of their own accord. This is essential for their prosperity."—*Interview in New York Times*, Oct. 21, 1898.

(g) (According to the tale from which the following excerpt is taken, Master Harold Jones, having under stress of severe temptation disobeyed his parents by going swimming and afterwards fighting one of the boys, is taken red-handed by his father, soundly thrashed on the spot, and delivered over to his mother with the words:)

"I found this young gentleman in swimming—swimming and fighting. I have attended to his wants, I believe. I leave him to you."

Harold Jones was but a lad—a good lad whose knowledge of the golden text was his Sunday-school teacher's pride—yet he had collected other scraps of useful information as he journeyed through life, and one of these was a perfectly practical familiarity with the official road-map to his mother's heart. Therefore, when he crossed the threshold of the Jones home Harold began at once to weep dolefully.

"Harold Jones, what do you mean by such conduct?" asked his mother.

The boy stood by the window long enough to see that his father had turned the corner toward the town. Then

he fell on the floor, and began to bewail his lot, refusing to answer the first question his mother asked, but telling instead how "all the other boys in this town can go swimmin' when they want to," hinting that he wouldn't care, if papa had only just come and brought him home, but that papa—and this was followed by a vocal cataract of woe that made the dishpans ring.

He noted that his mother bent over him and said, "My poor boy;" at which sign little Harold punctured the levees of his grief again, and said he "never was going to face any of the boys in this town again"—he "just couldn't bear it." Mrs. Jones paused in her work at this, put down a potato which she was peeling, and stood up stiffly, saying in a freezing tone, "Harold Jones, you don't mean to tell me that your father punished you in front of those other little boys?"

Her son only sobbed and nodded an affirmative, and gave lusty voice to the tearful wish that he was dead. Mrs. Jones stooped to the floor and took her child by an arm, lifting him to his feet. She smoothed his hair and took him with her to the big chair in the dining-room, where she raised his seventy pounds to her lap, saying as she did so, "Mamma's boy will soon be too big to hold." At that the spoiled child only renewed his weeping and clutched her tightly. There, little by little, he forgot the mishaps of the day. There the anguish lifted from his heart, and when his mother asked, "Harold, why did you go into the water when we told you not to?" the child only shook his head, and, after repeated questioning, his answer came:

"Well, they asked me, mom."

"Who asked you?" persisted Mrs. Jones.

"Piggy Pennington and Jimmy Sears," returned the lad.

To the query, "Well, do you have to do everything they ask you to, Harold?" the lad's answer was a renewal of the heart-breaking sobs. These softened the mother's heart, as many and many a woman's heart has been melted through all the ages. She soothed the truant child and petted him, until the cramping in his throat relaxed sufficiently to admit of the passage of an astonishingly large slice of bread and butter and sugar. After it was disposed of, Harold busied himself by assorting his old iron scraps on the back porch, and his mother smiled as she fancied she heard the boy trying to whistle a tune.

Harold had left the porch before his father came home with the beefsteak for supper, and Mrs. Jones met her husband with: "Pa Jones, what could you be thinking of—punishing that boy before the other children? Do you want to break what little spirit he has? Why, that child was nearly in hysterics for an hour after you left!" —Wm. Allen White: *The Martyrdom of "Mealy" Jones*, *McClure's Magazine*, vol. IX, p. 973.

(h) I knew one [schoolboy] about eight years of age, whose success at guessing in the game of "even and odd" attracted universal admiration. This game is simple and is played with marbles. One player holds in his hand a number of these toys, and demands of another whether that number is even or odd. If the guess is right, the guesser wins one; if wrong, he loses one. The boy to whom I allude won all the marbles of the school. Of course he had some principle of guessing; and this lay in mere observation and admeasurement of the astuteness of his opponents. For example, an arrant simpleton is his opponent, and holding up his closed hand asks, "Are they even or odd?" Our schoolboy replies "Odd," and loses; but upon the second trial he wins,

for he then says to himself, "The simpleton had them even upon the first trial, and his amount of cunning is just sufficient to make him have them odd upon the second; I will therefore guess odd;" and he guesses odd and wins. Now, with a simpleton a degree above the first he would have reasoned thus: "This fellow finds that in the first instance I guessed odd, and in the second he will propose to himself, upon the first impulse, a simple variation from even to odd, as did the first simpleton; but then a second thought will suggest that this is too simple a variation, and finally he will decide upon putting it even as before. I will therefore guess even;" he guesses even and wins.—E. A. Poe: *The Purloined Letter*.

4. Refute as completely as possible the conclusion of each of the reasoning processes analyzed in Exercise 3, stating the method or methods used.

5. Write an *a priori* argument based on Stockton's story, *The Lady or the Tiger?* After reading the story, imagine yourself in the place of the hero, or in that of one of the spectators at the moment when the princess raises her hand to point to the door which she wishes her lover to open. Determine from your knowledge of her character which door she will indicate, that of the tiger or that of the lady, and write out the reasoning process by which you come to this conclusion in such a way as to convince another person of the truth of your inference.

6. Complete the story of *Edwin Drood*, analyzing the *a priori* reasoning which you have used.*

* Or the teacher may read to the class the first part of any suitable short story, stopping at a point where the characters and the situation have been outlined, but the outcome is still uncertain, and require the class to anticipate the solution of the plot, on the basis of the characters and the situation.

7. Write an *a priori* argument leading to any one of the following conclusions:

(a) Golf* will shortly lose its popularity.

(b) ———† will write a creditable commencement speech. ‡

(c) A certain rule § will soon be abolished in ———§ school (or college).

(d) A certain practice § in ———§ school (or college) will shortly be done away with.

(e) Women will be allowed to vote on all questions in all States. ||

(f) ———¶ will be the next President of the United States.

(g) A certain bill** will pass the United States Senate. ††

(h) A certain senator ‡‡ will vote for a certain bill.

(i) Kipling's fame will increase with time.

(j) Manual training will eventually form a part of all secondary school education.

(k) Poe §§ will some day be recognized as one of the world's great poets.

(l) Capital punishment will ultimately be abolished throughout the civilized world.

* Any other game may be substituted.

† The name of a certain commencement speaker in the school or college to which the student belongs should be supplied.

‡ Or will deliver it effectively.

§ Naming it.

|| Or the name of a single State may be substituted.

¶ The name of any presidential possibility should be supplied.

** Naming one at present under consideration.

†† Or any other legislative body.

‡‡ Naming him. A member of any legislative body may be mentioned.

§§ The name of any other poet may be substituted.

(*m*) Commencement essays will be done away with by all colleges.*

(*n*) Electricity will supplant steam as a motive power for railway trains.

(*o*) Horse-power will cease to be used for private carriages before the middle of the twentieth century.

(*p*) A satisfactory flying machine will some day be invented.

* Or by any one particular college or school.

CHAPTER VII.

A POSTERIORI REASONING AND ARGUMENT.

THE essential character of *a posteriori* reasoning has been suggested in the foregoing chapter.* Like *a priori* reasoning, the *a posteriori* process bases itself upon an observed sequence of events. *A posteriori* reasoning, however, instead of inferring the second event, the first being given, starts at the other end of the series and infers the first member, the second serving as datum. Such habitual series as those discussed in Chapter VI. may again serve us for illustration. Having firmly established in our own minds the sequence between a hard frost and the blighted appearance of garden plants, we may not only by *a priori* reasoning conclude that this particular frost will blight the plants in the garden, but, by *a posteriori* reasoning, we may infer from the limp and blackened appearance of the plants that there was a severe frost last night. Or, looking out in the morning and seeing the walks wet and the gutters full of water, we say, "It must have rained last night."

Such reasoning as this was used by Robinson Crusoe, when, discovering the print of a man's foot in the sand, he concluded that a man had visited the island. In following a trail one must reason thus from the second member of the series, which is seen, to the first, which is

* See p. 116.

unseen; from the half-effaced print in the soil, the broken twig, and the disarranged branches to the passing of some creature or creatures; from the number, size, and form of the tracks, the peculiar manner in which the twig is broken and the branches disarranged, to the kind of creatures, their number, their size, and physical condition, with sometimes even the purpose of their movements and the success or failure of them. All this belongs to woodcraft in general and to hunting in particular. Indians are supposed to be adepts at this process of inference, their forest life naturally tending to make them very dependent upon it.*

In judging character or motive from external evidences, the *a posteriori* reasoning is used. One decides from a person's face, from his actions, from his talk, or from his reputation, what his character is; or from the thing he does, the motive he had for doing it.†

* Hence stories of Indians and pioneers, such as Cooper's novels, and of animals, such as Kipling's *Jungle Books*, abound in *a posteriori* reasoning.

From this type of the reasoning backward doubtless sprang the name often applied to all its types, "the reasoning from sign." The "sign" is, of course, the second member of the series, and becomes a sign of the first only because inductively one has come to the conclusion that the second is always preceded by the first.

† In reading novels, especially of the modern realistic type, we must determine the characters of the persons represented just as we determine those of people we meet in real life. We are not now, as in the old-fashioned romance, told directly and at some length what the characters of the hero and heroine are, but must infer these characters from the action and conversation recorded.

Many essays on literary subjects attempt by means of *a posteriori* reasoning to infer from the writings from a certain author his character, tastes, sensory development, habits of mind, and previous experiences. Of such essays Bagehot's *Shakespeare the Man* may stand as type.

The determination of character and motive from external evidence is closely allied with the use of the *a posteriori* reasoning in the detection of crime. Here the commission of the crime is the second member of the habitual series, the first being concealed by the design of the criminal. The first member may be the criminal's deliberate plan to forge the check or to murder the victim; it may be the appearance of a sudden temptation in the way of opportunity or necessity or both combined; but whatever it is, this concealed event must be traced out relentlessly by the backward looking process of reasoning. Being established, it may then serve as datum for a second *a posteriori* process, and thus a long chain of past events be reconstructed from a single one. This method of unraveling a mystery, first popularized by the detective stories of Poe, seems almost more fascinating than any other of the numerous applications of *a posteriori* reasoning. Such effort has been made to conceal the first member of the series that the triumph of the discovery is enhanced.

The achievements of this reasoning in the field of science are, however, even more marvelous, though so familiar that they may be passed with a word. The science of palæontology, we are often told, is able, by the *a posteriori* process of reasoning, to determine the general configuration, the character of the soil, and even the climatic conditions of a certain tract of country during a certain prehistoric period, to furnish proof of the previous existence there of a plant-species which has been extinct for numberless centuries, to reconstruct an entire

The "internal evidence" as to the authorship of certain works and the dates at which certain writings were produced also involves this process of reasoning.

group of hitherto unknown animals from a single bone found in a certain geologic stratum.* And the same process of reasoning enables us, in archæological investigations, to read the entire life of a perished race from the vestiges of its civilization.

The syllogistic form of this reasoning is correlative with that of the *a priori* process.† Events of the class B, we say, are always preceded by event A. This particular event belongs to the class B and hence must have been preceded by event A. Or, still more simply:

- I. B is always preceded by A.
- II. This event is B.
- III. This event is preceded by A.

Thus, in a case of suicide:

- I. The discovery of a man dead under certain peculiar circumstances (he being subject to melancholia and having often threatened to take his own life, a pistol wound being discovered in his head, made by a ball of the same calibre as those in his pistol lying beside him, the doors and windows of the room being all so securely fastened from the inside that they had to be broken in) is always preceded by the act of suicide.

* Thackeray draws a half-humorous parallel (*The Newcomes*, vol. II., ch. IX.) between these achievements and those of the novelist. "As Professor Owen or Professor Agassiz takes a fragment of a bone, and builds an enormous forgotten monster out of it, wallowing in primæval quagmires, tearing down leaves and branches of plants that flourished thousands of years ago and perhaps may be coal by this time—so the novelist puts this and that together: from the footprint finds the foot; from the foot, the brute who trod on it; from the brute, the plant he browsed on, the marsh in which he swam."

† See Ch. VI., p. 115.

- II. This discovery is that of a man dead under certain peculiar circumstances (stating them as in I.).
- III. This discovery was preceded by the act of suicide.

A similar analysis might be made of the reasoning process by which one infers that Kipling has acquired a knowledge of the process of engine-building.

- I. All writing of stories exactly describing the minutiae of engine-building is preceded by the author's acquisition of exact knowledge of the process of engine-building.
- II. The writing of the story .007 is the writing of a story exactly describing the minutiae of engine-building.
- III. The writing of this story was preceded by the author's acquisition of exact knowledge of the process of engine-building.

The past tense of the conclusion in *a posteriori* reasoning may be explained as was the future tense in *a priori* reasoning.* It is not required by the technical form of the syllogism, but belongs to the reasoner's own point of view with reference to the first member of the series. Event B, the second member, is either present or past. (It could not serve as datum were it future.) Event A, therefore, since it precedes B in point of time, must be referred to the past.

For the process of *a posteriori* argument, with the refutation thereof, the preceding chapter may again be consulted. In *a posteriori* argument, as in all other forms, the reasoning process of the writer must be established step by step in the reader's mind. This means, of course, that first the reader must be led to recognize the habitual series

* See Ch. VI., pp. 115-116.

of events and next to identify the event given with the second member of the series, the first being thereupon inferred.

Similarly, an *a posteriori* reasoning process may be overthrown by destroying either of these stages of the reasoning process or by establishing a contradictory conclusion upon the basis of a different series of events.

EXERCISES.

1. Find illustrations of your own, from observation or reading, of each of the uses of *a posteriori* reasoning mentioned in this chapter. Analyze each of these pieces of reasoning and refute it if you can.

2. Analyze completely the *a posteriori* reasoning involved in the following selections, refuting wherever the reasoning seems to you fallacious:

(a) At last I awake, very queer about the head, as from a giddy sleep, and see the butcher walking off, congratulated by the two other butchers and the sweep and publican, and putting on his coat as he goes; from which I augur, justly, that the victory is his.—Dickens: *David Copperfield*, ch. XVIII.

(b) “I perceive that you have been unwell lately. Summer colds are always a little trying.”

“I was confined to the house by a severe chill for three days last week. I thought, however, that I had cast off every trace of it.”

“So you have. You look remarkably robust.”

“How, then, did you know of it?”

“From your slippers.”

“How on earth ——.”

“Your slippers are new,” he said, “you could not have had them more than a few weeks. The soles which

you are at this moment presenting to me are slightly scorched. For a moment I thought they might have got wet and been burned in the drying. But near the instep there is a small circular wafer of paper with the shopman's hieroglyphics upon it. Damp would of course have removed this. You had, then, been sitting with your feet outstretched to the fire, which a man would hardly do even in so wet a June as this if he were in his full health."

—A. Conan Doyle: *Memoirs of Sherlock Holmes*.

(c) Prof. Petrie showed diagrams of cylindrical seals as used by the kings of the first three dynasties, and impressions of such cylinders which were vastly more frequently found than the seals themselves. He then showed a vase exhibiting the earliest representation of Egyptian mythology, and other vases, tablets, and slates showing animals and birds, such as the hawk, bull, lion, and leopard, which manifested a well-acquired knowledge of these animals, as well as of the ibex, gazelle, and antelope. Large numbers of animals, such as the calf, monkey, and dog, had been found modeled in green clay, together with a model of a lion in red pottery. These finds were very important, as they showed the skill in clay modeling of the earliest dynasty, the rise of the art of modeling, and the Egyptian ideas and appreciation of the forms of animals and of the human body. These important monuments of the civil life of the early kings proved that glazing was a specialty of the original people, and that Egyptian art reached its high-water mark somewhere before B.C. 4000.

Other finds showed the kings in triumph over their enemies, receiving captive kings, opening the public works, or reclaiming the marshes. Others were vessels with dedications written upon them, and stone jars with

chambers as storehouses for the king's soul. The handled copper vessels showed the most advanced metal-work found of the first three dynasties. The population of the pre-dynastic age was different in type from that of historical times, and in the early monuments the presence of diverse types was very clear, some being shaven, some bearded, some long-haired. We had at last before us evidence of the close of the period previously considered prehistoric, showing the development of the art, writing, and civilization of Egypt and the composition of a race which had since maintained its character during 6000 years.—*New York Times, Report of Lecture by Prof. W. M. Flinders Petrie.*

(d) It is plain what Spain wants of the Philippines. She wants to get something out of them. That a bankrupt nation without a navy should keep and administer a group of islands half the world away is out of the question. It becomes more flatly out of the question when her government has produced a lively revolt in every one of them in which it has ever been carried on or asserted. If the Philippines were all given back to Spain to-morrow the Spanish forces in them would all be annihilated before the year was out.

But although Spain cannot hold the Philippines she can, she thinks, make them figure as an asset in her schedules. If we admit her ownership she might claim some compensation from us, if we choose to take them over as a war indemnity. If we do not choose she can still peddle them about Europe, and she could doubtless find a purchaser if she could show a clear title.

This explains the pretense of horror in Madrid over our claim to the Philippines, it explains the tenacity of the Spanish Commissioners in Paris. It is not a question of

our allowing Spain to hold them. She simply cannot hold them. It is a question of our allowing her to sell them. And that we cannot allow, in default of a purchaser satisfactory to ourselves.

(e) Artistically considered, Cleopatra is, perhaps, the masterpiece among Shakespeare's female characters; given the problem, Shakespeare has solved it as no one else could have done. But what conflicts must his soul have endured, what bitter experiences must he have passed through, to have set himself such a problem, to have created a woman so widely different from all those he had pictured before—a woman so devoid of the ideal womanly graces, yet so irresistible, for whose sake Antony sacrifices the dominion of the world.—Bernhard Ten Brink: *Five Lectures on Shakespeare*.

(f) He (Mr. Glegg) noticed remarkable coincidences between these zoological phenomena and the great events of that time—as, for example, that before the burning of York Minster there had been mysterious serpentine marks on the leaves of the rose-trees, together with an unusual prevalence of slugs, which he had been puzzled to know the meaning of, until it flashed upon him with this melancholy conflagration.”—George Eliot: *Mill on the Floss*.

(g) “I've seen the rabbit's track when I knew he was dodgin' the fox, for *his* catlike dots were in the snow by the side of it, and **you** could see some places where he had run his sharp nose into the rabbit's prints. . . .

“One day last winter, . . . I cut across the cornfield, and I found a peculiar mouse-track. It ended suddenly and there were broad wing-strokes in the snow. I knew, of course, that meant a tragedy, and by the broad scratches I knew it was a hawk or an owl, not a . . .

shrike; but as I stooped I was puzzled. There was no tailmark."

"A short-tailed meadow mouse," interrupted Shan.—J. N. Baskett: *At You-All's House*, ch. X.

(h) Every one in Bayshore was informed this afternoon that Burnside Jayne, son of Andrew Jayne, had either committed suicide or been accidentally killed by the discharge of his shotgun. Young Jayne, despite the positiveness of the assertions, based upon the information and belief of his own father, is alive and as well as ever, beyond suffering from a headache.

The young man went hunting this morning, and while away came upon a supply of cherry wine, which he liked so well that he was unsteady when he reached home, carrying a gun in one hand and a bottle of the wine in the other. He sat down on the doorstep and fell asleep, and in some manner the bottle broke and the red wine dyed his hair, face, neck, and clothing on the upper part of his body. The gun slipped down, and as he sat his chin rested upon the muzzle, while the butt rested upon the ground. In that position and condition he was seen by his father, who immediately rushed off for a doctor, and the report spread that Burnside Jayne was dead.

The doctor came, examined the young man, smelled his breath and the clothing, took a pail of water and washed off the wine and at the same time cooled the hot head of the young man, who awakened. How he managed to break the bottle so that it dyed him as it did is not easily understood.

3. Analyze the *a posteriori* reasoning involved in each of the following essays or stories:

(a) Kipling's *The King's Ancus*, in *The Second Jungle Book*.

(b) Poe's *The Purloined Letter*, *The Gold-bug*, *The Murders in the Rue Morgue*.

(c) Conan Doyle's *A Study in Scarlet*.

(d) Fiske's *What We Learn from Old Aryan Words*, in *Excursions of an Evolutionist*.

(e) Winchell's *Sketches of Creation*.

(f) Ten Brink's *Five Lectures on Shakespeare*, first and second lectures, *The Poet and the Man* and *The Chronology of Shakespeare's Works*.

(g) Bagehot's *Shakespeare the Man*.

4. Does the physician ever need to use *a posteriori* reasoning? When? Analyze the process. Give instances of the use of *a posteriori* reasoning by the naturalist: by the student of chemistry: by the housekeeper.

5. Write out an exact description of a scene you once witnessed, whose meaning you do not (or did not) know, taking pains not to suggest any explanation. Then hand this description to another student in the class, receiving one from him in exchange. Write out a full explanation of this scene so far as it appears to you explicable, analyzing the *a posteriori* process of reasoning by which you have interpreted it.*

* A scene admitting of such interpretation is described in Henry Kingsley's *The Hillyars and the Burtons*, Ch. XXVII. "A couple came from the rest and stood at the window together, behind the half-drawn curtains; and I could see them, for their heads were against the light. He was a gallant youth . . . and she seemed beautiful. . . . He spoke eagerly to her, but she never looked towards him; he seemed to speak more eagerly yet and tried to take her hand; but she withdrew it, and he slowly left her and went back into the room; but she remained, and I saw her pulling the flowers from her nosegay and petulantly throwing them on the carpet, while she looked out steadily across the wild, sweeping river."

6. Write an account of the events just preceding that represented in any picture which seems to tell a story.*

7. Decide on the motive of the lady who smiled and of the lady who frowned in Stockton's story, *The Discourager of Hesitancy* in the *Century Magazine*, vol. XXX., (new series VIII.), p. 482.

8. Write an *a posteriori* argument leading to any one of the following conclusions:

(a) ——— † is quick-witted.

(b) ——— † has had a refined home-training. ‡

(c) The man § who sat next me in the street car to-day is a farmer. ||

(d) ——— ¶ is intellectually alert, sympathetic, and fun-loving. **

(e) ——— †† is conscientious and methodical. ‡‡

(f) The late war with Spain was brought about by the politicians. §§

(g) Shelley was very sensitive to odors. |||

(h) Byron was particularly fond of dark colors.

(i) Tennyson lacked depth of feeling.

* Such pictures should be selected by the teacher and hung where they can be studied by the student.

† Name some friend or acquaintance.

‡ Substitute any other similar inference.

§ Or woman.

|| Or a druggist, a plumber, a tailor, a physician, etc.

¶ The original of a photograph displayed by the teacher.

** Substitute any other characteristics.

†† The name of some public character should be supplied.

‡‡ Other characteristics may be substituted. The inference may be drawn from this person's dress, the appearance of his room or his desk, his manners, his actions, or any other similar data,

§§ Those of a certain party may be specified.

||| Or Wordsworth, to sound.

(*j*) The existing translation of the *Romaunt of the Rose* is Chaucer's.

(*k*) Horace imitated Lucilius.

(*l*) The writers of the gospels were truthful men.

(*m*) Francis Bacon wrote Shakespeare's plays.

(*n*) The Iliad was written by several persons.

CHAPTER VIII.

REASONING AND ARGUMENT FROM ANALOGY AND *A FORTIORI*.

WE often find ourselves coming to a conclusion about a certain object or individual on the basis of its resemblance to another individual or object. Thus one says, "People can't possibly reach their full measure of healthy mental and moral growth if they are all the time moving from place to place. How would you expect a tree to flourish if you dug it up every few years and set it down in another spot?"

This kind of reasoning we call reasoning from analogy. It is commonly explained as resting upon a presupposition that when two things are alike what is true of the one is true of the other also, the observation that the two things involved in the analogy are alike, and a judgment already arrived at concerning one of them. Thus, in the reasoning just cited, trees and human beings are in some respects alike, therefore it is inferred that the development of people must suffer from frequent changes of location just as that of trees does.

This explanation approximates the truth, but fails to note the limitations of the analogy. We should not reason that because a child and a mouse are both timid, the child must be fond of cheese! A likeness in certain respects between two things does not induce the reasoner

to attribute to one of them all the characteristics of the other. One is, however, impelled to such a conclusion as that the growth of human beings is injured by frequent changes of situation, because the growth of trees is thus impaired, provided always that the characteristic common both to trees and to people is one which would tend to affect their growth—such a characteristic, let us say, as that of a peculiarly intimate relation to environment. A dim sense of this common quality must hover in the background of the reasoner's consciousness, as the conclusion takes form in his mind. He does not, perhaps, rigidly define to himself this common characteristic. He may only recognize the fact that trees suffer from frequent transplanting and perceive vaguely that they represent a larger class of things as yet unnamed, whose organization is such that it demands a close and a continuous relation with its environment. Human beings, he is sure, fall within this unnamed class to which trees belong, the class of things having a certain peculiar organization, which makes them dependent on their environment. Therefore, people also, like trees, must suffer from frequent uprooting.

If we analyze this process of reasoning into technical terms, we find that its major premise is an induction from a single instance. Trees suffer from frequent transplanting, therefore all members of the shadowy class to which trees belong suffer under frequent transplanting. From this point the deduction is typical. Human beings belong to this undefined class to which trees also belong, hence human beings also suffer from frequent transplanting.

Reasoning from analogy thus employs as its middle term a class of things which is at once vague and concrete.

The middle term in the syllogism implied above is defined only by naming one of its members. It is "the class of things to which trees belong," rather than "the class of growing things which are intimately related to their environment." From this lack of sharp definition of the middle term arises the fallacy to which reasoning from analogy is peculiarly liable—that of mistaking the middle term. Out of its context, "the class to which trees belong" might mean any one of a dozen different classes—the class of salient features in the landscape, that of sources of fuel, that of means of shade, that of symbols, that of growing things, that of things which should be planted, that of influences upon the rainfall, that of studies for artists—the catalogue is endless. If, therefore, one fails to define the class to himself by its abstract characteristic as well as by reference to one of its members, he may at length awake to the discovery that his reasoning is confused and hopelessly discredited by the presence of two middle terms instead of one. The inference that this child must be fond of cheese because her movements are like those of a mouse is a flagrant instance of this duplicity in the middle term.

- I. All creatures of the class to which mice belong
(the class having a certain digestive apparatus,
say) are fond of cheese.
- II. This child belongs to the class to which mice
belong (the class of creatures whose movements
are furtive and nervous).
- III. This child is fond of cheese.

The vagueness of the middle term in the reasoning from analogy is thus often a positive disadvantage. Its concreteness is, however, an advantage, equally positive,

when this type of reasoning is used for purposes of argument. The parables of the New Testament are doubtless the most remarkable examples of the argument from analogy. Addressed, as they were primarily, to an audience of uneducated minds, they found a tremendous advantage in the use of the concrete form of statement. Instead of "the class of valuable things lost," "the class of things to which a lost coin belongs" is presented to the hearer's mind; instead of "the class of great results attained by inconsiderable means," we have "the class of things to which belongs the growth of the mustard-tree from the mustard-seed." The class thus brought concretely before the mind by instancing a single member of it is far more real to the hearer than any abstract statement of its characteristics could possibly make it.

The exact analysis of an opponent's argument has heretofore been enjoined as a prerequisite to all successful refutation; but the general necessity for this analysis increases in the case of the argument from analogy. Here the undefined middle term may conceal a specious fallacy. Only when it is clearly defined, so that its duplicities, if any, become apparent, is one ready to refute or accept the argument. To show a fallacy in the form of the syllogism, due to the ambiguities of the middle term, is, then, one useful method of direct refutation. The other method, that of disproving either the major or the minor premise, need not be discussed, since it differs in no essential from this method as used in connection with other forms of deductive argument. Indirect refutation is, of course, often available in connection with the direct method.

A form of reasoning closely associated with the reasoning from analogy is that termed reasoning *a fortiori*.

This reasoning also involves an analogy or comparison between two members in the same class. Of one of them a certain judgment has been admitted. Of the other it must then be also allowed, on the basis of their common membership in the class. But, as it happens, the second member's relation to the class is far closer and more unmistakable than that of the first member. Hence the judgment concerning the first must not only be true of the second, but far more true than it was of the first. Such is the typical form of the *a fortiori* reasoning.

This reasoning is illustrated by such an argument as the following:

“Men are always very careful about choosing a good horse because a great deal depends upon it, but they should be far more careful about choosing a good wife because far more depends upon it.” *

This reasoning assigns the choice of a good wife to the class of choices which ought to be made with great care, on the basis of its membership in the class of choices upon which a great deal depends, this latter class being wholly included in the class of choices which should be carefully made. According to this analysis, the reasoning is of the ordinary deductive form. But it will be noted that the middle term, although defined as the class of choices on which much depends, is also designated more vaguely as the class of choices to which the choice of a horse belongs. The class of choices to which the choice of a horse belongs is included in the class of choices which should be carefully made, and the choice of a wife falls within the class of choices to which the choice of a horse belongs; hence the choice of a wife should be made with care. Here is a piece of reasoning from analogy,—the

* Thomas More, *Utopia*.

middle term being at first undefined, but later formulated exactly. Yet the conclusion is surely more than that the choice of a wife should be made with care. The choice of a wife should be made with greater care than the choice of a horse demands, inasmuch as upon the choice of a wife more depends. The syllogistic form, though necessarily involved in its phraseology, follows substantially the form of the reasoning from analogy:

- I. Choices of the class to which the choice of a horse belongs (i.e. choices upon which much depends), but belonging to that class more indisputably than does the choice of a horse, should be made with more care than the choice of a horse.
- II. The choice of a wife belongs to the class of choices to which the choice of a horse belongs, but belongs to that class more indisputably than does the choice of a horse.
- III. The choice of a wife should be made with more care than the choice of a horse.

Such reasoning, it is evident, is only an intensification of the reasoning from analogy, hence the previous observations upon that type will in the main apply to the reasoning and argument *a fortiori*.

EXERCISES.

1. Analyze the reasoning implicit in each of the following arguments, refuting it whenever possible. State whether the argument is from analogy or *a fortiori*.

(a) Through his naked eye man sees less than six

thousand stars; through a powerful telescope he may see a hundred million. Is there not a similar exaltation of all his faculties as they expand under true culture?

(b) Every man that striveth for the mastery is temperate in all things. Now they do it to obtain a corruptible crown, but we an incorruptible.—*I. Corinthians*, 9 : 25.

(c) I consider a human soul without education like marble in the quarry, which shows none of its inherent beauties until the skill of the polisher fetches out the colors, makes the surface shine, and discovers every ornamental cloud, spot, and vein that runs through the body of it.—Joseph Addison.

(d) Seeing that the spinal cord and medulla oblongata are found capable of originating muscular contractions, we are entitled to suppose that the far larger masses that make up the brain may be the sources of a much more abundant and conspicuous activity than these examples afford.—Alexander Bain: *Senses and Intellect*, p. 78.

(e) The cheaper the cost of transmission, the larger the bulk of freight which can be carried for the same sum. And so, the smaller the amount of mental energy required to understand the words a writer uses, the larger the quantity of thought which he can comprehend. This is Spencer's theory of economy as applied to style.

(f) The Academy has rather a bright idea. It suggests that inasmuch as the Government superintends the construction of houses and compels builders to construct them properly, the Government might also superintend the construction of novels. Without doubt there are hosts of novels which are built of excellent materials, but which are constructed so badly that they prove to be disastrous failures. If a competent Government official—say Sir

Walter Besant or some other thoroughly good and experienced workman—were to examine the plot of every new novel, and to point out to the author such changes as would make it coherent and safe, there would be a vast improvement in that particular field of literature. The Government already exercises a censorship over plays in order that they may be made to meet the requirements of Mrs. Grundy. If it can thus oversee the construction of plays with a view to making them moral, it can surely oversee the construction of novels in order to make them fit additions to our literature.

(g) Thus in poetry, the expression is that which charms the reader and beautifies the design, which is only the outlines of the fables. It is true the design must of itself be good; if it be vicious, or, in one word, unpleasing, the cost of coloring is thrown away upon it. It is an ugly woman in a rich habit, set out with jewels; nothing can become her. But granting the design to be moderately good, it is like an excellent complexion with indifferent features; the white and red well mingled on the face make what was before but passable appear beautiful.—John Dryden: *Parallel between Poetry and Painting*.

(h) Mr. Stelling concluded that Tom's brain, being peculiarly impervious to etymology and demonstrations, was peculiarly in need of being ploughed and harrowed by these patent implements; it was his favorite metaphor, that the classics and geometry constituted that culture of the mind which prepared it for the reception of any subsequent crop. I say nothing against Mr. Stelling's theory; if we are to have one regimen for all minds, his seems to me as good as any other. I only know it turned out as uncomfortably for Tom Tulliver as if he had been

plied with cheese in order to remedy a gastric weakness which prevented him from digesting it. It is astonishing what a different result one gets by changing the metaphor! —George Eliot: *The Mill on the Floss*.

(i) Money is now exactly what mountain promontories over public roads were in old times. The barons fought for them fairly:—the strongest and cunningest got them; then fortified them; and made every one who passed below pay toll. Well, capital now is exactly what crags were then. Men fight fairly (we will, at least, grant so much, though it is more than we ought) for their money; but, once having got it, the fortified millionaire can make everybody who passes below pay toll to his million, and build another tower of his money castle. And I can tell you, the poor vagrants by the roadside suffer now quite as much from the bag-baron as ever they did from the crag-baron. Bags and crags have just the same result on rags.—John Ruskin: *Crown of Wild Olive*; *Work*.

(j) An apple-tree, if you take out every day, for a number of days, a load of loam and put in a load of sand about its roots, will find it out. An apple-tree is a stupid kind of creature, but if this treatment be pursued for a short time it will feel and will manifest the effects of it. And if you take out of State street the ten honestest merchants, and put in ten roguish persons, controlling the same amount of capital, it will not be long before society knows the difference. Its growth is less sturdy and its heart less sound.

(k) Could a linguist, could a grammarian, could even a mathematician have seen what she did, have witnessed their appearance together, and heard their history of it, without feeling that circumstances had been at work to make them peculiarly interesting to each other? How

much more must an imaginist like herself be on fire with speculation and foresight!—Jane Austen: *Emma*.

(l) “ I certainly have not the talent which some people possess,” said Darcy, “ of conversing easily with those I have never seen before. I cannot catch their tone of conversation or appear interested in their concerns, as I often see done.”

“ My fingers,” said Elizabeth, “ do not move over this instrument in the masterly manner which I see so many women’s do. They have not the same force or rapidity, and do not produce the same expression. But then I have always supposed it to be my own fault—because I would not take the trouble of practicing. It is not that I do not believe my fingers as capable as any other woman’s of superior execution.”—Jane Austen: *Pride and Prejudice*.

(m) To rear a boy under what parents call the “ sheltered-life system ” is, if the boy must go into the world and fend for himself, not wise. . . . Let a puppy eat the soap in the bathroom or chew a newly-blackened boot. He chews and chuckles, until, by and by, he finds out that blacking and Old Brown Windsor make him very sick; so he argues that soap and boots are not wholesome. Any old dog about the house will soon show him the un-wisdom of biting big dogs’ ears. Being young, he remembers, and goes abroad, at six months, a well-mannered little beast, with a chastened appetite. If he had been kept away from boots and soap and big dogs till he came to the full-grown and well-developed teeth, just consider how fearfully sick and thrashed he would be! Apply that notion to the “ sheltered life ” and see how it works.—Kipling: *Plain Tales from the Hills; Thrown Away*.

2. Supply a suitable analogy by which one might arrive at each of the following conclusions. Write out a complete argument from analogy leading to one of these conclusions:

(a) Reading many books produces a wide culture.

(b) A Wagner concert more than two hours in length depletes the nervous system.

(c) The mental training of an individual should be based on a scientific examination of his natural endowments.

(d) Teaching in the public schools should be part of the civil service.

(e) Life at a co-educational college is a benefit to the average girl.

(f) The rich and the poor* are mutually dependent.

(g) Newspapers should contain no sensational material.

(h) Healthful mental life depends upon an equilibrium between the activities of acquiring and imparting knowledge.

(i) Professors of political economy are not good judges of the best financial policy for a nation.

(j) A little talent in an essentially common person is peculiarly detestable.

(k) Freedom of thought is essential to intellectual growth.

(l) The ability to write well can be acquired.

(m) Things one wishes to eat are usually good for his health.

(n) Criticism should stimulate rather than paralyze.

(o) Criminals should be completely isolated from society for the course of their natural lives.

* Or capital and labor.

(*p*) The dormitory system for colleges* is desirable.

3. Plan out a line of argument by which, using the *a fortiori* reasoning, each of the following conclusions might be established. Write an *a fortiori* argument leading to one of them:

(*a*) Borrowed books should be used with especial care.

(*b*) Social graces are particularly needed in family life.

(*c*) Good teachers should be assigned to the primary grades.

(*d*) Eight hours of daily work should be the maximum for a college student.

(*e*) The study of music † is an essential part of education.

(*f*) Gymnasium work should be required of all students in college.

(*g*) Students should take a great deal of outdoor exercise.

(*h*) Every woman should be able to earn her own living.

(*i*) Women who desire to do so should enter the profession of medicine. ‡

(*j*) Cooking and sewing should be taught to girls in the public schools.

* A certain college may be specified.

† Any other subject may be substituted.

‡ Any other profession or business may be substituted.

APPENDIX A.

INDUCTIVE REASONING IN MODERN EDUCATIONAL METHODS.

THE essential nature of inductive reasoning may be illumined by some illustrations of its more obvious uses, both practical and theoretic. One particularly interesting illustration on the practical side is here presented as a suggestion to the teacher. Similarly the inductive process might be traced in the generalizations of popular philosophy, both those which have crystallized into proverbs and those which have not yet assumed an exact formulation, in superstitions, both primitive and more developed, and in the laws determined by every branch of science.

The inductive process of reasoning has recently become very conspicuous in our methods of education. The old idea of education was to give a student all the generalizations he needed, and let him only apply them to particular cases. Thus, in mathematics he would be told that the square of the hypotenuse in a right-angled triangle equals the sum of the squares of the other two sides; so that all he had to do when he wished to know the length of the hypotenuse in a certain right-angled triangle was to add the squares of the other two sides and extract the square root. In language-study he learned from a book that a certain combination of letters always stands for a certain word, so that he needed only when he met this particular combination of letters, to conclude that here, as everywhere else, it had the meaning assigned to it by the dictionary. When studying literature, he would read in a book that the poetry of Milton is sonorous and involved, so that he would be relieved of any obligation to do more than notice the involutions and the sonorities in

that particular poem of Milton's which he chanced to be reading.

The introduction of the laboratory method in natural science has, however, changed all this. The laboratory method means nothing else but induction. It means that the student, instead of accepting the inductive conclusions of other people, reaches his own, from facts that fall under his personal observation. Instead of being told that an explosion always results when oxygen and hydrogen are brought together and ignited, the student learns that this is so by trying it several times for himself. He learns that a salt is formed by the union of an acid and a base, because he has found it so innumerable times; that a submerged body displaces its own volume of water, by submerging several bodies of known volumes and measuring the water displaced.

This method, transferred to language-study, has given us the system by which the student, beginning to read before any grammatical principles have been imparted, formulates for himself the law that a certain combination of letters or sounds always means a certain definite thing; that the object of a verb always ends in certain letters; or that nouns with certain meanings are always neuter. These generalizations, formerly given to the student in the form of rules which he must apply, must now be discovered, as well as applied, by himself.

One of the most conspicuous instances of the use of the inductive method in education appears in the modern teaching of English. In this subject students are not now set to master general principles of composition from books of rhetoric, but are required to formulate these for themselves from particular pieces of literature which are given them to study, and from their own writing. For instance, after noting several times that a piece of prose which is easy to read has a distinct plan, the student is led to the generalization that all pieces of prose which are easy to read have a distinct plan. And such a generalization would be still further confirmed if several times, when the student has taken care to have a plan, his writing has proved easy to read.

In much the same way he determines laws for the employment of certain methods in the processes of description and exposition, for the use of unified paragraphs, clear sentences, and suggestive words. He is not told that concrete words produce a sharper effect upon the reader's mind than abstract

ones, but discovers the truth for himself, to apply as he finds occasion for it.

Such typical examples of the use of the inductive method in education may serve to represent the others. The study of history by the seminary method of individual research, and the establishment of psychological principles by experiment, will at once suggest themselves as supplementary illustrations.

APPENDIX B.

THE RELATIONS BETWEEN INDUCTIVE AND DEDUCTIVE REASONING.

IN the text has been implied the popular view of the relations between induction and deduction; namely, that they are two processes, directly opposed to one another. Induction, we have said, judges of the class from its members; deduction, of the members from their class. Technically, the one is said to pass from particular truths to a general truth, the other from a general to a particular truth. That is, induction proceeds from the particular truths that each of four cats has claws, to the general truth that all cats have claws; while deduction, from the general truth that all cats have claws, derives the particular truth that this cat has claws. The two processes are thus seen to move in opposite directions. Induction is said to be the means by which one builds up his conception of a certain class; deduction the means by which he determines the membership of a given individual in that class.

Induction and deduction may thus be said, according to the common conceptions of their relations, to start from different points, and by moving in different directions reach different conclusions. Induction begins with facts, the logicians say; deduction with principles. Or, induction starts from particular facts, deduction from a general truth. Induction proceeds toward a judgment of the class as a whole from judgments of some of its separate members, on the assumption that what is true of several of these members is true of the class as a whole. Deduction moves toward a judgment of some particular member of the class, from a judgment of the class as a whole, on the assumption that what is true of the class is true of each of its members. And, finally, induction

arrives at a conclusion unlimited both as to time and as to the class which it involves; while deduction leads to a conclusion limited to one particular individual in the class, and to one particular period of time. This distinction may be further pursued. The inductive conclusion, as we have noted, characterizes the whole of a certain class, assigns that class *in toto* to a certain other class. All iron is heavy, all the good die young, all curses come home to roost, all birds of a feather flock together. There is no limitation placed upon the conclusion within the limits of the class itself. The deductive conclusion, on the other hand, is limited to a single member in the class concerned. It declares, not that all iron is heavy, but that this particular piece is heavy; not that all Quakers say "thee" and "thou," but that this particular Quaker is certain to say "thee" and "thou." The inductive and the deductive conclusions differ, then, in the range of their characterization.

The inductive conclusion is unlimited with reference not only to the class which it characterizes, but with reference to the time with which it deals. Though present in tense, it refers not to the present alone, but to all time—past, present, and future. "Water seeks its level," means not only that it does so at the present minute, but that it has done so in the past and presumably will continue to do so in the future. Anemones always bloom in the spring; God always tempers the wind to the shorn lamb; a fair day always follows a red sunset—in all these cases the time-reference is unlimited. The inductive conclusion is sometimes regarded as having no concern with time, as being an absolute, timeless generalization or law; but it should rather be viewed as including all time, having validity alike for past, present, and future.

In sharp contrast with the unlimited time-reference of the inductive conclusion is the particular location in time of the deductive conclusion. "The Columbia is a good make of wheel," we say, not meaning necessarily that it has been good in the past, still less that it is certain to be in the future. It simply is at the present moment. Or some one declares that Bryan will be the next President of the United States, with no explicit reference either to past or to present. Or, finally, we may assert that the late war with Spain was brought about by the politicians, referring plainly not to present or to future time, but to the past alone.

In brief, then, we may agree that with reference both to class and to time the inductive conclusion is unlimited, the deductive conclusion limited. This is, of course, only put-

ting into other phraseology the statement commonly made that the inductive conclusion is general or universal, the deductive conclusion specific or particular.

This antithesis which we have recognized between the inductive and the deductive processes of reasoning is one supported by history. The deductive process was recognized and analyzed by Aristotle centuries before the inductive process was noticed at all. It was not until Bacon, in the *Advancement of Learning*, called attention to the inductive reasoning as a method of scientific research, that this mode of thinking was explicitly recognized; and even then it was considered not as a logical instrument of general usefulness, but only as a means to discoveries in natural science. This late recognition of inductive reasoning is doubtless a prime cause for the pronounced tendency on the part of logicians to set it in direct opposition to deduction, regarding the two processes as essentially different, even antagonistic, in their nature.

This tendency has not, however, been so universal as to prevent the recognition, in certain quarters, of the close interdependence of these two processes of reasoning. The appreciation of this relationship has even gone so far as to attempt the reduction of the two processes to one. It is easy to see how this might be effected.

All reasoning may be regarded as ultimately inductive. If we examine any piece of deductive reasoning we shall find that it rests upon some underlying process of thought. You may come to the conclusion, before tasting your glass of lemonade, that it is sour, but in order to come to this conclusion you must first have arrived at the inductive generalization, "All lemonade tastes sour." Underlying deduction is always induction. The last root of every argument is always inductive. The final conclusion may be reached by a deductive argument, but supporting this and making it possible will be found a second reasoning process, below this perhaps a third; and however far you descend you are sure to come at last to an inductive process of reasoning the foundation of the whole.

Deduction, in short, is only a further stage of induction. It only makes explicit what was implied in the inductive conclusion. If you once come to believe that "All deer are afraid of men," it is quite superfluous to conclude further that this particular deer is sure to be afraid of men. Your inductive conclusion has told you that. It has embraced within itself every possible deductive conclusion about the timidity of

particular deer. From this point of view, then, all reasoning may be regarded as ultimately inductive.

But in another aspect all reasoning appears as ultimately deductive. Every particular fact which supports an inductive conclusion may be regarded as the conclusion of a deductive process of reasoning. Thus the generalization "All deer are afraid of men," drawn from the particular facts "This deer is afraid of men," "That deer is afraid of men," "The deer I saw in the park was afraid of men," and other similar observations, rests ultimately upon deduction, since each of these particular facts is established by a deductive process of reasoning. How do you know that this particular deer was afraid of men? Undoubtedly because it ran from them, trembling as they approached. Here we have, then, a deductive syllogism supporting each particular fact in the inductive process of reasoning.

- I. All animals who run from men are afraid of men.
- II. This deer runs from men.
- III. This deer is afraid of men.

Further, every piece of induction may be viewed as a deductive syllogism, its assumption acting as the major premise.

- I. What is true of four deer is true of all.
- II. It is true of four deer that they are afraid of men.
- III. It is true of all deer that they are afraid of men.

Both these attempts to reduce all reasoning to a single form, either induction or deduction, have a certain interest for us, inasmuch as they show us how very close the relationship between them is; how, in spite of certain apparent differences in function, they are interwoven so subtly in all our mental processes that to say which is the basis of our thinking is quite impossible. All attempts to determine which process is foundation and which superstructure—that is, which comes first in our mental operations—must always be as futile as the world-old controversy between intuitionists and experientialists in philosophy—of which controversy this is, indeed, a branch. Ultimately the question becomes one of psychology. Is the child born with knowledge of certain general principles which serve to interpret all his particular experiences? or is he merely beaten upon by successive experiences, meaningless at first, but finally organized by him into general laws or principles? Which comes first

in the experience of the child, his notions of class or his ideas of individuals?

To such inquiries as this, modern philosophy has but one answer. Neither intuition nor experience is first, neither the class nor the individual, but both arise together in the beginnings of the child's consciousness. As we push backward toward the beginnings of consciousness, we reach the point at which the child knows nothing explicitly about any class of objects or any individual object, but is simply rained upon by external stimuli, heat, light, color, and the rest, each arousing some faint sensation, but this sensation not sharply discriminated by the child from any other sensation. Little by little, however, these sensations come to be recognized as different from each other; that is, are traced back to different objects. And in so far as they seem different, they are, of course, recognized as fundamentally alike. Without a basis of identity no discrimination is possible. Thus, the sense of difference and the idea of identity arise simultaneously; the notions of class and of individual spring from the same sheath. Certain sensations of color, let us say, are traced to different objects, though all differing from sensations of heat or of outline. Color-sensations thus come to constitute a class made up of individual color-sensations. This done, the whole course of inductive and deductive reasoning lies open. The shadowy sense of class is developed into clearness by successive inductions based upon observations of certain members of the class. Vague judgments as to individual members of the class are defined by clearer notions of the class as a whole. And thus the reciprocal process goes on simultaneously, induction proceeding no faster than deduction, deduction no further than induction.

The appeal to psychology, then, has led us to conclude that the processes of induction and of deduction arise side by side out of the chaos of the child's earliest consciousness. Neither can, in last analysis, be said to precede the other, since they are two phases or aspects of the same process of thought, each involving and each resting upon the other. We may see in any given case that a deductive is supported by an inductive process, or an inductive by a deductive; but, passing down through as many strata as we please, we shall at the last stratum always find the two, the judgment of class and the judgment of individual, arising together, mutually involved, as the processes of induction and deduction are throughout their history.

In conclusion, we may repeat, induction is not, strictly speaking, the basis of deduction, nor deduction the fulfillment of induction; but induction is both the foundation and the superstructure of deduction — deduction both the starting-point and the goal of induction. Neither can stand without the aid of the other. Each is essential, not alone to the completeness, but to the very existence of the other.

APPENDIX C.

DEBATING.

THOUGH the subject of debating is not necessarily included under the head of argumentation, some slight discussion of it seems advisable, inasmuch as its connection with argumentation is so close. The relations and the essential distinction between the two processes should at the outset be clearly defined. Debating is often regarded simply as oral argument. All oral argument is not, however, strictly speaking, debate, while some written argument is debate, being frequently committed to paper before being orally delivered; hence this distinction falls to the ground. The fundamental difference between the two processes lies deeper than this, in the fact that debate is an affair of three parties, argument of two. In ordinary argument only the speaker* and the audience* are concerned. The speaker attempts to set up in the mind of the hearer some conclusion at which he himself has already arrived, the hearer perhaps resisting for a time the establishment of this conclusion, perhaps permitting it without a struggle. In debate, however, three participate: the speaker and the audience, as before, but also a representative of the resisting element in the mind of the audience—the speaker's opponent. He embodies and expresses the opposition felt by the audience to the speaker's conclusion, as the speaker embodies and expresses its acquiescence. The two opposing debaters, then, represent each a distinct movement of the mind of the audience toward or away from a certain conclusion, and of these the one who so develops and intensifies the movement he represents that it becomes dominant

* The term speaker is intended to cover both speaker and writer; the term audience, both reader and hearer.

over and ultimately displaces the other—this debater is said to win the debate. This means, not, indeed, that he convinces his opponent of the truth of his position, as would be the case were he engaged in simple argument, but in the strife with this opponent to bring the audience to the one conclusion or the other, he has gained his point. He has voiced the instinctive tendencies of the audience toward the conclusion he represents, so effectively that they believe in that conclusion far more intelligently and far more strongly than they did at the outset. Perhaps they did not even know that they did believe in this conclusion before it was championed by the debater. There was only in their minds a dim prepossession toward one opinion, or an equally dim reluctance to accept another. But the debater has brought to articulate and reasonable speech all these formless tendencies of their thought. Their blind preferences and repulsions he has defined into expression. Such is the function of the debater.

The debater's task, it is evident, is in some ways more difficult than that of the person who sustains one side of a simple argument. The latter may, indeed meet a certain resistance, but this resistance is often of an unorganized and ineffective sort. Usually the hearer is somewhat unprepared for the attack of the speaker, and submits with greater or less reluctance to be led toward the speaker's conclusion. Often, particularly in the case of political or religious addresses, the audience is already inclined toward this conclusion, or it would not have come to hear the argument. If not directly inclined, however, its resistance is dumb and inchoate, not explicitly declared.

The very overtness of the opposition which the debater must meet may, perhaps, seem to afford him a certain advantage. One may imagine that the debater is not, like the man engaged in simple argument, required to divine the objections to his conclusion which lurk half consciously in the mind of his audience, but, having these objections stated openly, he can bend all his energies to the task of controverting each in turn. But this advantage is by no means so considerable as it appears, since the fact that his opponent professes to voice the resistance of the audience to the conclusion proposed, by no means insures his actually doing so, nor absolves the debater from the necessity of satisfying himself that all the objections of the audience have, in truth, been detected by his opponent, and presented, each with its proper emphasis in a word, that he is not buffeting a man of straw, disproving

considerations that have no place in the minds of the audience, while allowing others to flourish there unchecked.

In spite, then, of the fact that one's opponent in debating assumes to formulate all the latent objections of the audience to the conclusion proposed on the other side, the debater must rely upon himself to discover these objections as well as to controvert them. And this consideration brings us fairly to the essentials for successful debating. These are, of course, involved in the nature of the process itself. Since debating reduces itself, under analysis, to an explicit presentation on each side of the implicit movement of the mind of the audience toward or away from a certain conclusion, it is evident that its success must depend upon two prime conditions: First, the clearness with which each speaker divines the unspoken reasonings of the audience; and, second, the force with which these reasonings are presented.

It is a commonplace of debating that each speaker must know his opponent's side of the question as well as his own. This means, of course, that he must know the mind of the audience, not in part only, but as a whole; all its native repulsions from a certain conclusion, as well as all its latent prepossessions toward it. He must study the subject completely, in order that he may have in hand all the data, which, if possessed by any individual in the audience, would lead him either toward or away from the conclusion he desires to establish. And having this data well in hand, he must also know, from a practical study of logical principles, how these facts or considerations are likely to be used by the audience as confirmation or as disproof of the conclusion he seeks to establish.

This done, he has the subject-matter of the debate—the reasonings of the audience from certain data both toward and away from the debated conclusion. His task is now but to fortify those reasonings which move toward the conclusion he represents, and bring to naught those which tend toward the opposing conviction. The second condition of success is, then, the forceful presentation of the audience's reasonings which support the debater's conclusion, and the complete overthrow of all reasonings which oppose it. These two processes are essential in every debate. They are sometimes known as positive and negative proof, respectively; more often as proof and refutation. Under the latter names they have become familiar in the previous discussions on argument, hence need not be re-canvassed here. It may, however, be noted in general under the head of the forcible presentation

of the implicit reasonings of an audience, that nothing yields more to this end than a careful planning of the presentation. Such careful planning implies that the reasonings of the audience should be set forth distinctly and in order, each process being completely unfolded, and no process being repeated; that the emphasis be justly distributed, and that a cumulative effect be secured. All these are, however, the axioms of debate, and may be left with the mere statement.

The technical details of debating are usually so familiar to students, that they will need no detailed consideration. The question should be formulated affirmatively, as: "Resolved, That the administration of McKinley has contributed to the prosperity and the best interests of this country." Two parties, evenly divided as to numbers, should debate the question on the affirmative and negative sides. The affirmative side aims to establish the conclusion as stated in the question for debate; the negative, to establish the contradictory conclusion: "The administration of McKinley has not contributed to the prosperity and best interests of this country." Each side, of course, attempts not merely to establish its own conclusion, and thus indirectly to overthrow the contradictory conclusion, but endeavors to disprove directly the conclusion of the opposite party, to the end that its own conclusion may be the more firmly established. The debate on each side is organized and headed by a leader, who plans it from the beginning, assigning to each member of his own party his share in the common task.

The function of the leader is thus supremely important. He must determine what points on his side shall be presented, if time forbids the use of all; in what order they shall appear, how much time and emphasis shall be given to each, what part of the debate he himself shall undertake, and what shall be given to each of his colleagues, so that the whole ground shall be adequately covered, and no part of it be covered twice. He must himself make the opening and the closing speech on his own side. In his first speech he should usually outline the field of debate, stating the point in question, getting all irrelevant issues out of the way, and indicating briefly the way by which his party proposes to prove its conclusion. He will need also to present one distinct phase of the argument, this being more or less considerable according to the number of his colleagues. If he has but one colleague, he must necessarily assume a larger part of the argument than he would do if his party were larger. The

division of the debate for assignment to various people is a question which cannot be dogmatically passed upon, since it must be decided by the exigencies of the particular case. In a debate for municipal ownership and control of street railways, for instance, the positive proof falls under two or more heads, such as arguments based on economic, on social, and on ethical considerations, or arguments of abstract justice and arguments of expediency; and the negative proof is also divisible, not only into direct and indirect refutation, but direct refutation into the disproof of the advisability of several different plans, as private ownership of street railways with private control, private ownership with public control, and public ownership with private control. In such a debate the problem of assignment to the various participants is of necessity quite different from the problem presented by a debate on the comparatively simple question, "Resolved, That the profits of the railroads are excessive," in which case the grand divisions of positive proof and refutation are hardly further divisible, unless the positive argument resolve itself into the proof that rates rising above a certain figure are excessive, and the proof that railroad rates actually do rise above this figure. A careful study of the possibilities and requirements of each particular subject for debate is the only means of attaining a satisfactory division of the question.

The closing speech of the leader, following those of his colleagues, should be largely devoted to summing up the arguments on his side and on the other, showing what his side has proved and disproved, and calling attention to what the other side has failed to establish or to overthrow. As a rule, no new material should be introduced into the closing speech, though a necessary refutation is permitted. The closing speech should be as carefully prepared as the opening, in anticipation of the line of argument to be taken by the opposition, and should cover the entire ground of debate.

The conventional order of debate is as follows :

1. Leader on the affirmative side.
2. Leader on the negative side.
3. First affirmative colleague.
4. First negative colleague.
5. Second affirmative colleague.
6. Second negative colleague, etc.
7. Leader on the affirmative.
8. Leader on the negative.

The affirmative leader thus has the advantage of making the opening, the negative leader that of making the closing speech in the debate. Each speaker is usually given a definite time for his argument, and is called to order by the chairman if he exceeds it.

According to established usage, each speaker, on taking the floor, addresses the chairman, and is recognized by him before beginning his speech. Every remark made upon the floor is addressed, not to one's opponents or allies, but to the chair and the audience. No debater is referred to by name, but as "The leader on the negative side," or "The second speaker on the affirmative." For any personal, or in any way unbecoming remarks, the chairman is authorized to call the offender to order.

Debate is sometimes written out in full and read from manuscript, but in so doing half its force is lost. If the participants cannot speak quite extemporaneously, they may use slight notes of the headings of their arguments, written on a small paper, preferably not larger than a visiting-card, held in the hand. They should be as independent as possible, even of this aid, but the consciousness of its availability in case of need sometimes imparts the desired confidence. The novice in debating should not fear present failure so much as the acquisition of habits that will effectually prevent future success. As, in learning a new game, the score is nothing, but the stroke, or method of play, everything, so in debating; to win this debate or that is a matter of small consequence, unless one be at the same time learning the clean stroke and the perfect poise that will insure future victories.

It may be of interest to supplement this short account of the theory of debating by the report of a practical course in debating given at Vassar College for the past two years by the departments of Economics and of English,* conjointly. This course is named on the English side "Advanced Argumentation: Oral Debates"; on the Economics side, "The Relation of the State to Monopolies," the two titles indicating respectively the subject-matter and the form of the course. The class meets twice a week through one semester. After two or three introductory lectures from each department, on the sources of the material and the general theory of debate, the

* The idea of this course originated, it should be said, with Professor Herbert E. Mills, of the department of Economics.

students themselves take charge of the course. Having been assigned at the beginning of the semester to a certain place on a certain debate, that of leader on one side or the other, colleague, chairman, or critic, each student fulfills her part without further direction, the instructors being open to consultation, and always present at the debates to criticise or commend, but taking no further part in the class exercises.

The list of questions set for debate in the year 1898-9 follows. Where the word "Brief" follows the subject, there is no oral debate, but a brief is presented by each student on one side or the other. The words "Brief and debate" indicate that a brief upon the whole subject is first prepared by each student, and the debate is then conducted by certain members of the class. An impromptu debate is arranged by requiring each student to canvass the entire subject on both sides, and be assigned to one side or the other after coming to the class.

1. Speculation is detrimental to the interests of the community.

2. Stock-watering is detrimental to the interests of the community.

3. The profits of the railroads are excessive. (Brief.)

4. The principle of "charging what the traffic will bear" is the only practicable method of determining railroad rates.

5. An amendment should be made to the Inter-state Commerce Law allowing the formation of pools, subject to the approval and regulation of the Inter-state Commerce Commission.

6. The Inter-state Commerce Law should be repealed.

7. The experience of other nations is favorable to state ownership of railroads. (Brief.)

8. The railroads of the United States should be owned and managed by the National Government.

9. The Dartmouth College decision was an unfortunate one from the standpoint of public welfare. (Impromptu debate.)

10. Trusts should be prohibited by law.

11. The Standard Oil Trust has been and is a pernicious and dangerous combination. (Impromptu debate.)

12. The National Government should own and manage the telegraph service.

13. The public should own and control the telephone service.

14. The municipalities should own and manage their street railways.
15. The municipalities should own and manage their gas and electric lighting plants.
16. The State governments should own the forests.

APPENDIX D.

UNCLASSIFIED ARGUMENTS FOR ANALYSIS.*

"I KNOW what Latin is very well," said Maggie, confidently. "Latin's a language. There are Latin words in the dictionary. There's bonus—a gift."

"Now, you're just wrong there, Miss Maggie!" said Tom, secretly astonished. "You think you're very wise! But 'bonus' means 'good,' as it happens—bonus, bona, bonum."

"Well, that's no reason why it shouldn't mean 'gift,'" said Maggie, stoutly. "It may mean several things—almost every word does. There's 'lawn'—it means the grass-plot, as well as the stuff pocket-handkerchiefs are made of."

George Eliot : *Mill on the Floss*.

"There are some very odd things any anatomist can tell, showing how our recent contrivances are anticipated in the human body. In the alimentary canal there are certain pointed eminences called *villi*, and certain ridges called *valvulæ conniventes*. The makers of heating apparatus have exactly reproduced the first in the 'pot' of their furnaces, and the second in many of the radiators to be seen in our public buildings. The object in the body and in the heating apparatus is the same—to increase the extent of surface. We mix hair with plaster (as the Egyptians mixed straw with clay to make bricks), so that it shall hold more firmly. But before man had any artificial dwelling, the same contrivance of mixing fibrous threads with a cohesive substance had been em-

*Much additional material may be gained from literary sources, readily accessible; for instance, the theological arguments in *Paradise Lost*, almost any of Bacon's *Essays*, Tennyson's *Two Voices*, the reasonings of Hamlet and other characters in Shakespeare's plays, and, for refutation, Lamb's *Popular Fallacies* in the *Last Essays of Elia*. For other suggestions, see the Preface, and the Exercises at the close of Chapter VII.

analogy
 ployed in the jointed fabric of his own spinal column. . . .
 The dome, the round and the Gothic arch, the groined roof,
 the flying buttress, are all familiar to those who have studied
 the bony frame of man. All forms of the lever, and all the
 principal kinds of hinges, are to be met with in our own
 frames."

O. W. Holmes : *Poet at the Breakfast-Table*, pp. 321-2.

In the realm of poesy American women have to their credit some notable achievements. Our literature has been appreciably enhanced by the writings of Mrs. Sigourney, Helen Hunt Jackson, Mrs. Spofford, Edith M. Thomas, Emma Lazarus, the Cary sisters, Celia Thaxter, Mrs. Dorr, Julia Ward Howe, and others. The novel has gained a higher and more dignified place in the esteem of the reading public through the works of Mrs. Burnett, Mrs. Burton Harrison, Amélie Rives, Julien Gordon, Amelia E. Barr, Constance Fenimore Woolson, and a score or more of other female weavers of romance.—*New York Times*.

That the early Aryans were acquainted with the sea seems unquestionable, for the name occurs, with very little change in sound and hardly any in meaning, in nearly all the Indo-European languages. The Lat. *mare*, whence our adjective *marine*, appears in Skr. *mira*, Russ. *moru*, Lith. *mares*, Irish *muir*, Welsh *mor*, Goth. *marei*, O. H. G. *mari*, Old Norse *mar*, Old Eng. *mere*.

John Fiske : *Excursions of an Evolutionist*, p. 143.

A day is a more magnificent cloth than any muslin, the mechanism that makes it is infinitely cunninger, and you shall not conceal the sleazy, fraudulent, rotten hours you have slipped into the piece, nor fear that any honest thread, or straighter steel, or more inflexible shaft, will not testify in the web.

Ralph Waldo Emerson : *Power*.

Let us begin with a remark which sounds somewhat paradoxical : the poet makes use not only of others, but more particularly of himself, his own writings ; and he likewise makes allusions in his later works to his earlier ones. This is not always done so palpably as to be at once apparent to a dull perception. When we see *The Merry Wives*, the Falstaff who appears in that piece necessarily reminds us of the character of the same name in "Henry IV.," and no one can doubt that the comedy of *The Merry Wives* presupposes "Henry IV.," and that, therefore, it must have

been produced later, but yet not much later. The matter is, however, not always so clear; indeed, the poet himself may be unconscious that one of his former creations is exercising a subtle influence upon his mind. The following appears to me to exemplify what I have in my mind:

In one of those fateful monologues spoken by Macbeth before his awful deed, . . . he weighs the consequences of his intended crime:

“ But in these cases
We still have judgment here; that we but teach
Bloody instructions, which, being taught, return
To plague the inventor: this even-handed justice
Commends the ingredients of our poison’d chalice
To our own lips.”

. . . Why was it just the poisoned chalice that occurred to Shakespeare? The case, surely, is not a usual one that a person with the intention of killing another should poison a cup and then in some way be put in a position to drink it himself. It is hardly to be doubted that a scene of one of his own dramas passed before his mind. You remember the highly symbolical concluding scene in *Hamlet* where the crime contrived by the king in conjunction with Laertes recoils upon its originators, and where Hamlet finally forces the king to drink the cup which the latter had prepared for him . . . It is not probable that in making Macbeth speak those lines it was Shakespeare’s object to allude to the catastrophe in *Hamlet*. Involuntarily, however, justice presented itself to him in the image of that scene.

Bernhard Ten Brink: *Five Lectures on Shakespeare*.

Let us draw a lesson from nature, which always works by short ways. When the fruit is ripe, it falls. When the fruit is dispatched, the leaf falls. The circuit of the waters is mere falling. The walking of man and all animals is a falling forward. All our manual labor and works of strength, as prying, splitting, digging, rowing, and so forth, are done by dint of continual falling, and the globe, earth, moon, comet, sun, star, fall forever and ever.

Emerson: *Essays, First Series, Spiritual Laws*.

There is never any Sunday in a novel proper. The seventh stitch is dropped, and the thread catches directly over from Saturday night to Monday morning.

A. D. T. Whitney: *Odd or Even*, ch. xxx., p. 213.

In 1816 Mr. Clay voted for a new compensation act of Congress. It aroused a tornado of popular wrath. Not even the great commoner could stand against this, and he sagaciously resolved to try and weather it. Meeting a staunch supporter who had turned against him, he said :

"Jack, you have a good flintlock, haven't you?"

"Yes."

"Did it ever flash in the pan?"

"Once it did, but only once."

"What did you do with it? Did you throw it away?"

"No, I picked the flint and tried it again."

"Well," said Mr. Clay, "I have only flashed once—on this compensation bill—and are you going to throw me away?"

"No," cried the hunter, touched in his tenderest part; "no, Mr. Clay, I will pick the flint and try you again."

Henry Watterson: *Oratory of the Stump*,

Youth's Companion, Oct. 27, 1898.

Wild flowers that seem so fresh and young are, singularly enough, the especial prey of old maids. Young girls love the garden flowers; beautiful women surround themselves with hothouse hues and perfumes. But who goes into the woods, explores the rocky glens, braves the swamps? Always the ardent-hearted old maid, who, in her plain garb and thick shoes, is searching for the delicate little wild blossoms the world over.—C. F. Woolson: *Anne*, ch. x.

The effect of historical reading is analogous, in many respects, to that produced by foreign travel. The student, like the tourist, is transported into a new state of society. He sees new fashions. He hears new modes of expression. His mind is enlarged by contemplating the wide diversities of laws, of morals, and of manners.

Macaulay: *Essay on History*.

It has recently been said, and not without a degree of truth, that the modern movement for expansion, which has made England active and potential at the ends of the earth, did not originate in the mind of a statesman, and was not the result of the scheming of a shrewd politician like Beaconsfield, but received its most powerful impulse from three writers: Carlyle, Tennyson, and Kipling. These men of letters, like many of their predecessors, have not urged definite policies upon their countrymen; but they have given the English spirit and temper the impulse of sharp definition and of deep and passionate faith. Indeed, the service of

English literature as a practical force in English life cannot be overstated. It has done more than any other single force to give the English race clear consciousness of its strength, its aims, and its work; it has bound the race together in the consciousness of a rich and enduring community of history and fortune. Shakespeare has done more for England in forming this consciousness than Pitt, or Peel, or Gladstone.

If this service was needed in a country of such narrow territory, with a population so compact, as England, it is sorely needed in this country, with its immense distances and its widely separated communities. And when one adds to these natural conditions the complexity of races now learning to live together in the republic, the necessity of a literature that shall develop first a national consciousness, and then clarify national spiritual ideals and make them authoritative, becomes even painfully apparent. A literature adequate in its power and vision to the range of life on this continent is a prime necessity for our safety. We need a literature which shall speak to and for the consciousness of the nation, as the New England literature spoke to and for the consciousness of New England. The note of nationality was struck with resonant clearness by Emerson, Lowell, and Whittier; but the force and depth of conscious national life were not behind these earlier poets as they will be behind their successors. The time was not ripe; but it is fast ripening.

H. W. Mabie: *Forum*, January, 1899.

The quarrels and divisions about religion were evils unknown to the heathen. The reason was, because the religion of the heathen consisted rather in rites and ceremonies than in any constant belief.—Bacon: *On Unity in Religion*.

Although Mr. Sidney Cooper has attained the great age of ninety-five, writes a correspondent of the London *Daily Telegraph*, he is still four years behind the old master, Titian, who lived till he was ninety-nine. Mr. Cooper is still hale and strong, and on July 23 last attended the Lord Mayor's banquet, "in honor of Art," at the Mansion House, adding to his signature in the visitors' book the optimistic note, "aged ninety-four years." It is interesting to recall the fact that he and Mr. Watts exhibited in the Royal Academy of 1837—the first year of the present reign. With regard to painters' ages, note should be taken that many of the old masters lived to an advanced age. For example, the following may be quoted: Michael Angelo, 89; Hals, 86; Hobbema, 81; Teniers, 80; Morales, 80; Greuze, 80; Ghirlandajo, 78; Snyder, 78; Tie-

polo, 77; Mantegna, 75; Van der Heyden, 75; Vernet, 75; Van de Velde, 74; Poussin, 72; Mabuse, 71; De Keyser, 71; Matsys, 70; Wynants, 70; Dolci, 70. There are, of course, many others, and there can be no doubt that the generality of artists are a long-lived race.

There is an old saying that "lawyers are poor Christians," yet the most brilliant and original representation of Christianity in our day has come from the pen of a jurist, namely, Rudolf Sohm, professor of law in the university and one of the compilers of the new Civil Law Book of the German Empire. His book on "Kirchenrecht" is an exceptionally scholarly investigation of the character of original Christianity, on a positive and conservative basis. Kahl and Rieker, two other prominent jurists, have also published works appreciative of the character and claims of Christianity. As a representative in the department of political economy, we draw attention to the lately deceased veteran authority, Professor Roscher of Leipsic, among whose papers was found a special work on Christianity, entitled "Spiritual Thoughts of a Student of Political Economy." This work shows how closely the author studied the Gospels and how keenly he appreciated their contents. Other names of men in this department of research who have publicly given expression to their favor of Christianity are Karl Knies, Theodore von der Goltz, Adolf Wagner, Gustav Schmoller. All these have in their writings, in the most positive manner, emphasized particularly the moral motives of Christianity, especially for the solution of the social problems of the day. The younger school of specialists in this science, headed by Professor Brentano of Munich, and containing among its members such men as Walter Lotz, Max Weber, and Gerhard von Schulze, have really made it a part of their programme to make the Christian Church the final court of appeal for the settlement of the social contests of the day, as this has been done in a more practical way by the English Christian-Socialists, such as Kingsley, Maurice, Ludlow, and Robertson.

Pastor Erich Foerster: *Das Christentum der Zeitgenossen*, Zeitschrift für Theologie und Kirche (Berlin), 1899, translated for *Literary Digest*, Jan. 28, 1899.

Why should any but professional moralists trouble themselves with the solution of moral difficulties? For, as we resort to a physician in case of any physical disease, so in case of any moral doubt or any moral disorganization, it seems

natural that we should rely upon the judgment of some man specially skilled in the treatment of such subjects.

Did Dickens deliberately aim to improve educational systems and reveal the principles of educational philosophy? The answer is easily found.

He was the first great English student of Froebel. He deals with nineteen different schools in his books. He gives more attention to the training of childhood than any other novelist or any other educator except Froebel. He was one of the first Englishmen to demand national control of education, even in private schools, and the thorough training of all teachers. He exposed fourteen types of coercion, and did more than any one else to lead Christian men and women to treat children humanely. Every book he wrote except two is rich in educational thought. He took the most advanced position on every phase of modern educational thought, except manual training. When he is thoroughly understood he will be recognized as the Froebel of England.—J. L. Hughes, *What Charles Dickens Did for Childhood*, Century Magazine, Vol. 57, p. 501.

Does any man doubt that if Judge Van Wyck is elected Governor he will turn out the thieving Republican canal deepeners and smash their ring? Will he not have the most powerful imaginable motive for putting as many as possible of them in the State prison; the desire, that is, of winning public confidence and approbation in a high degree?

Gov. Tilden's pursuit of the Tweed ring thieves made him Governor. His pursuit of the canal ring thieves made him the Democratic candidate for President. Nobody has forgotten that great example of popular trust and admiration centering upon a public officer who had exhibited great zeal and diligence in bringing to justice the rascals who had stolen the people's money. But let no man forget that the rascals Tilden pursued were his political enemies. Tweed had opposed him in the party, and at last, in his coarse and brutal way, had given him a public and mortal insult which Tilden could neither forget nor forgive. Tweed was doomed from that day. The biggest canal rascals were Republicans.

Every consideration, personal and political, will urge on Gov. Van Wyck to be swift and stern in his dealings with the Republican canal thieves. No consideration of any kind will hold him back.

With Gov. Roosevelt, on the contrary, the most powerful considerations will be those that restrain. Van Wyck will

build up his party by dragging this corruption into the light. Roosevelt will destroy his party if he touches it. A Democratic Governor might open the way to the Presidency by a triumphant campaign against the corruptionists. A Republican Governor who attacks George Aldridge and the other powerful Republicans who are responsible for the canal scandal must abandon all higher ambitions. He may smash the canal ring, but he will go out of politics at the end of his term just as Black goes out on Jan. 1.

There is nothing but Roosevelt's native dislike of unworthy public servants that would prompt him to make war on the canal rascals of his party. But how much of that dislike remains? He is making his campaign in strange companionship—Platt, Aldridge, Woodruff. If he can be on such good terms with Republican maladministration in the campaign, what reason have we to expect him after election to turn upon his present intimate associates with sudden austerity?

There is a deadly certainty of doom for the canal rascals if Van Wyck is elected. There is very grave doubt whether Roosevelt's big "if" wouldn't blind his eyes all through his term. If any voter wants the canal frauds punished he will vote against his intent if he votes for Roosevelt.

New York Times, Nov. 1, 1898.

It is plain what Spain wants of the Philippines. She wants to get something out of them. That a bankrupt nation without a navy should keep and administer a group of islands half the world away is out of the question. It becomes more flatly out of the question when her Government has produced a lively revolt in every one of them in which it has ever been carried on or asserted. If the Philippines were all given back to Spain to-morrow the Spanish forces in them would all be annihilated before the year was out.

But although Spain cannot hold the Philippines she can, she thinks, make them figure as an asset in her schedules. If we admit her ownership she might claim some compensation from us, if we choose to take them over as a war indemnity. If we do not choose she can still peddle them about Europe, and she could doubtless find a purchaser if she could show a clear title.

This explains the pretense of horror in Madrid over our claim to the Philippines; it explains the tenacity of the Spanish Commissioners in Paris. It is not a question of our allowing Spain to hold them. She simply cannot hold them. It is a question of our allowing her to sell them. And that

we cannot allow, in default of a purchaser satisfactory to ourselves.

One case, years ago, that helped me immensely in the business was a forgery. The man had disappeared and left no clew whatever behind.

I obtained access to his room and found that he had developed a partiality for cutting scraps from newspapers. There was a whole drawerful of these, and I went through them carefully.

Several had relation to forgery cases, and one cutting that appeared to be pretty badly fingered described how a forger had got away in woman's attire.

I worked on the theory that my bird had flown in this manner and followed it up until I finally got on the track and captured the criminal.

The capture was regarded as a very remarkable one, but, as a matter of fact, the runaway had left for me an exceedingly valuable clew. If he had taken the precaution to burn that cutting he might have escaped capture altogether."

It is certain that the city has received about \$140,000 in a year for the privilege of gleaning from the scows, in a very unclean condition, certain things that were dumped upon them by the Department carts. It is equally certain that the collection of these things and others, in a clean condition, directly from the houses and shops, will yield a much larger return.—Geo. E. Waring: *The Cleaning of a Great City*, *McClure's Magazine*, Sept., 1897.

It is worthy the observing, that there is no passion in the mind of man so weak but it mates and masters the fear of death; and therefore death is no such terrible enemy when a man hath so many attendants about him that can win the combat of him. Revenge triumphs over death; love slights it; honour aspireth to it; grief flieth to it; fear pre-occupateth it; nay, we read, after Otho the Emperor had slain himself, pity provoked many to die out of mere compassion to their sovereign; nay, Seneca adds niceness and satiety . . . A man would die, though he were neither valiant nor miserable, only upon a weariness to do the same thing so oft over and over."—Bacon: *Of Death*.

Whatever arguments apply to public-school education for boys must reach girls also. In the first place, girls need, even more than boys, to learn at school the qualities and merits of those in a different social circle, because if they do

not learn it then they may never learn it. Men learn it all through their lives, because almost every department of business brings into contact and comparison those trained in very different spheres. Women not engaged in business have much less opportunity for this contact; their homes include but two grades—employers and employed; and outside of their homes it is only some rare occasion of church work or charitable work which brings women into that easy intercourse, so familiar to men, with those out of their own set. If Ethel does not learn at school that the daughter of the coal-heaver or the washerwoman may be as good a scholar and even have as good manners as herself, she may never have another opportunity; whereas her brother may make the same discovery in college or in business. So far, then, the need of this free early intercourse would seem even greater in the case of the girl.

T. W. Higginson: *Concerning All of Us. The Contagion of Manners.*

M. Brunetière affirms anew, with energy, that science has not kept its promises. "In the plenitude of its power [he says], science promised that it would answer these redoubtable questions: Whence do we come? Why do we live? Whither are we going?" and he reproaches science for not having fulfilled its engagements.

Now the authority of M. Brunetière is great enough, even in matters of science, to make this dogmatic and almost solemn affirmation, coming from him, pass without contest and without protest. This is a great pity, for the so-called "promises" of science are of the domain of pure fancy. They have reality only in the imagination of M. Brunetière.

To begin with, "science has promised," he says. But what science? Who is this person? "I know not the lady," said De Maistre, speaking of "nature." I know no more of "science." Who has the right to speak in her name and make us absurd promises? If a scientist makes a mistake or commits himself to some hazardous statement, "science" is not responsible. The temerities of a *savant*, or of ten *savants*, or even of a thousand, can not compromise her. . . . Science . . . survives scientists, as good sense and esthetics survive the historians of literature.

Nevertheless, if we will, we may strictly consider as the "voice of science" the unanimous, or almost unanimous, accord of scientists on this or that point. There exists a sort of official science, that manifests itself by the classic and

uniform statement of certain facts. For example, all books on chemistry, English, French, Portuguese or Roumanian, agree that water is composed of oxygen and hydrogen, and on the methods of their preparation. This uniformity in description and exposition indicates that science is fixed on this point (in 1899, at least). Likewise, for the laws of luminous vibrations, in physics, or the phenomena of the circulation, in physiology, or the phases of the moon, in astronomy, or the solution of equations of the second degree in algebra. The standard treatises, elementary or higher, give quite exactly a picture of the present state of science.

In what standard works has science made the astonishing promises that M. Brunetière mentions with bitterness? . . .

We may even be permitted to be still more curious, and to ask in what scientific work, standard or not, M. Brunetière has run across his promises regarding the solution of enigmas? I do not believe that they are in the chemistry books. . . . Are they in the works on physics? Not at all. . . . Even the treatises on physiology do not discuss the problems so dear to M. Brunetière; they are occupied with quite different subjects, and the field for precise investigation that is offered to them is so vast that they have no need to get lost in metaphysical nebulosities. In treatises on zoology are found studies of higher and lower organisms and of the classification of lower animals. Botany occupies itself with plants; geology with fossils, terrestrial strata, and rocks. The destiny of man gives no concern to either botanists or zoologists, and it is not discussed in the works of the astronomers, the mathematicians, or the engineers.

It is true that certain anthropologists have put forth hypotheses about the origin of man—hypotheses suggested to them by the zoologists. These hypotheses are very probable, so probable that they are even taught by Catholics. The Darwinian theory of the evolution of species is no longer an object of horror as it was twenty-five years ago. . . .

But these are not promises. Although it is pretty nearly proven that living organisms have risen by evolution until the human species has been attained, this does not solve the terrible question, "Whence come we?" for to declare that man comes from the rudimentary organisms of the first geologic epochs is only to remove the difficulty a little. . . . Whence come those living germs themselves, from which man has sprung by progressive evolution? And why? Assuredly it is impossible for us to know; we must resign ourselves to ignorance. Never has there been a scientist worthy of the

name who has dared to promise us a certain solution to interrogations that must unceasingly be repeated.

Why, then, reproach science with not giving a solution, when she has never pretended to do so? . . . M. Brunetière's indignation is like that of a man who should reproach Leonardo da Vinci with having painted "La Gioconda," and Mozart with having composed "Don Juan," because neither "La Gioconda" nor "Don Juan" increases the speed of the express-trains from Paris to Havre.

Really, the reasoning of M. Brunetière has exactly this effect. "Incandescent lamps," he says, "cast no more light [on this question] than the candles of our sires; and serotherapy, which does not prevent our dying, gives us also no information about why we die."

So incandescent lamps and serotherapy are condemned, because neither of them has solved the problem of the origin, the object, and the end of life.

But they have never put forth this absurd pretense, M. Brunetière. Incandescent lights give us better illumination than candles; that is quite sufficient. As to serotherapy, do you really think that it is criminal because it does not give us the fountain of youth? It is saving the lives of a hundred thousand children every year; that is all!

A hundred thousand children! A negligible quantity, perhaps, for a haughty critic, and a slight result, if we compare it with what might be done with a magic liquid that would give us eternal youth.

Nevertheless, the lives of a hundred thousand children have a certain value; and M. Brunetière was not very happily inspired when he reproached us with serotherapy.

...

Science has already done admirable work. Can she go further? Doubtless. Every day brings some new conquest, without solving the final enigma of human destiny, which probably will never be solved.

Is M. Brunetière, with or without his friends, going to give us this desired solution, a solution that will not be ridiculous?

It is scarcely probable, disrespectful though it may be to refuse him this hope.

In any case he will not discourage us. The work of scientists and of science, in spite of the critics, will continue as in the past. A black shadow envelops us; mystery is round about us. This immense complexity of laws and of phenomena that enwraps us can not be untangled even partially, except by patient, long, and troublesome research. This is the task

of science. She has no other hope. She can make no other promise than that she will diminish a little the thickness of this frightful obscurity.

Is there any other way to dissipate these shadows except by the methods of scientific investigation? We know of none, and we wait for M. Brunetière or some one else to make one known to us.

And at the same time he will perhaps give us exact information about these famous promises of science, which have so roused his vehement indignation.

Charles Richet: *Revue Scientifique*, Jan. 14, 1899, translated for the *Literary Digest*, XVIII., 195.

The internal evidence that Burns in his celebrated song meant the rye-field, and not the River Rye, appears satisfactory.

1. He sang about many rivers and burns of his neighborhood, but he never left any doubt that he meant a stream.

“Adown winding Nith I did wander.”

“Behind yon hills where Stinchar flows.”

“Amang the bonnie winding banks, where Doon rins wimpling clear.”

2. He sang quite as many times about the fields and grain and never left any room for doubt on that score,

“Corn rigs are bonnie.”

“Wi’ sma’ persuasion she agreed

To see me thro’ the barley.”

“The rustling corn, the fruited thorn.”

“The waving grain, wide o’er the plain.”

“While the bloom is on the rye.”

3. Among country people it is the rule to rise early, while the dew is still on the grass. Work is begun generally before it has dried off. The flocks are afield, and must be brought home, the horses fed, the cows milked, etc. So it not only is not uncommon, but is usual for the lads and lasses to go out into the fields, getting their feet wet and “petticoats draigl’t” in the dew. What more natural than that the incident described should have happened? It undoubtedly did happen to Burns, probably many times, and whether so or not, it has happened (and will again) to many another. What more natural than that Burns should commemorate it with a song, especially as it was in his line, both of thought and poetry?

Compare the sentiment of the described meeting happen-

ing in a rye-field and in the crossing of a river, and the great probability in favor of the former will be apparent.

The blind beggar into whose hat the smallest French coin was thrown by a bystander exclaimed: "That must have been an Orleans prince!"

Youths' Companion, Oct. 20, 1898.

This is proved by many physiological experiments which cannot here be detailed; but outside of the laboratory we constantly apply the law of summation in our practical appeals. If a car-horse balks, the final way of starting him is by applying a number of customary incitements at once. If the driver uses reins and voice, if one bystander pulls at his head, another lashes his hind-quarters, the conductor rings the bell, and the dismounted passengers shove the car, all at the same moment, his obstinacy generally yields, and he goes on his way rejoicing. If we are striving to remember a lost name or fact, we think of as many "cues" as possible, so that by their joint action they may recall what no one of them can recall alone. The sight of a dead prey will often not stimulate a beast to pursuit, but if the sight of movement be added to that of form, pursuit occurs. "Brücke noted that his brainless hen, which made no attempt to peck at the grain under her very eyes, began pecking if the grain were thrown on the ground with force, so as to produce a rattling sound." "Dr. Allen Thomson hatched out some chickens on a carpet, where he kept them for several days. They showed no inclination to scrape, . . . but when Dr. Thomson sprinkled a little gravel on the carpet, . . . the chickens immediately began their scraping movements." A strange person, and darkness, are both of them stimuli to fear and mistrust in dogs (and, for the matter of that, in men). Neither circumstance alone may awaken outward manifestations, but together, i. e. when the strange man is met in the dark, the dog will be excited to violent defiance. Street-hawkers well know the efficacy of summation, for they arrange themselves in a line on the sidewalk, and the passer often buys from the last one of them, through the effect of the reiterated solicitation, what he refused to buy from the first in the row.

James: *Psychology*, pp. 129-130.

The Princess of Wales, during the London season, is one of the hardest worked women in England. She rarely gets to bed before 2 A. M. After her return about midnight from the entertainments at which her presence is a necessity, she

takes the hours from 12 to 2 to write private letters, because she has so little time during the day. When her children were young she made it a rule to breakfast at 8.30 A. M., so as to go into the schoolroom at 9 o'clock to inspect the "copies" written on the previous day.

Queen Victoria, though aged and infirm, never goes to bed before 12, and is awakened soon after 7 A. M. During the day she is so fully occupied that she has no time to lie down and rest, as most well-to-do women have at her age.

The Emperor of Germany rises at 5 in summer, at 6 in winter, and, as he expects the Empress to prepare his coffee herself, she has to get up equally early.

The late Empress of Austria was perhaps the earliest riser of all the royal personages of Europe. She allowed herself only the short sleep to be snatched between 11 P. M. and 3 A. M. After that she was up and insisted on her suit being up also.

We might best make a comparison. The poet is like a bee. His product is a honey, which is neither wholly his own nor wholly nature's. No pure nectar of flowers may be found in the bee's comb; the amber richness garnered there is a distillation of composite nature, a brew of flower-life and bee-life indescribably characteristic of both flower and bee. This is the formula for genuine originality—the personal quality of genius inseparably blent with the finest and rarest extracts of nature. A clear distinction may be easily made between what is written merely about nature and what is distilled from nature in the alembic of genius. The former may be attractive reading, the latter has for its distinction the haunting and tantalizing flavor of undiscoverable, immanent freshness.

Maurice Thompson : *Independent*, Feb. 2, 1899.

I want to read you some new passages from an interleaved copy of my book. You haven't read the printed part yet. I gave you a copy of it, but nobody reads a book that is given to him. Of course not.

O. W. Holmes : *Poet at the Breakfast Table*, p. 301.

Having, then, resolved that you will not waste recklessly, but earnestly use, these early days of yours, remember that all the duties of her children to England may be summed in two words—industry and honor. I say first, industry, for it is in this that soldier youth are especially tempted to fail. Yet, surely, there is no reason, because your life may possibly

or probably be shorter than other men's, that you should therefore waste more recklessly the portion of it that is granted you ; neither do the duties of your profession, which require you to keep your bodies strong, in any wise involve the keeping of your minds weak. So far from that, the experience, the hardship, and the activity of a soldier's life render his powers of thought more accurate than those of other men ; and while, for others, all knowledge is often little more than a means of amusement, there is no form of science which a soldier may not at some time or other find bearing on business of life and death. A young mathematician may be excused for languor in studying curves to be described only with a pencil ; but not in tracing those which are to be described with a rocket. Your knowledge of a wholesome herb may involve the feeding of an army, and acquaintance with an obscure point of geography, the success of a campaign. Never waste an instant's time, therefore ; the sin of idleness is a thousand-fold greater in you than in other youths, for the fates of those who will one day be under your command hang upon your knowledge. Lost moments now will be lost lives then, and every instant which you carelessly take for play you buy with blood.

John Ruskin : *Crown of Wild Olive ; War.*

There was some serious cause which induced nearly 150,000 Republicans to vote for the Hon. Seth Low for mayor of New York in 1897. There is no disguising the fact that the cause was a determination on the part of those who so voted to protest against the domination by Senator Platt of the Republican party of this State.

There has not been any change for the better in Mr. Platt's policy, but there has been added to the causes which led the majority of the Republicans of this city to vote for the Hon. Seth Low, Algerism, Aldridgeism, the Force bill, the press-gag law, the frauds in the City Works Department in Brooklyn, and other minor causes to lead the same electors to vote against Senator Platt's domination this fall. If to the vote cast for Mayor Van Wyck in 1897 we add 148,000 votes cast for the Hon. Seth Low, we shall have probably a fair estimate of the number of votes which will be cast in Greater New York for the Hon. Augustus Van Wyck for Governor of this State.

In the names of wars the defeated nation comes first, as the Franco-Prussian, the Austro-Italian, and, more recently,

the China-Japanese and the Græco-Turkish wars. Hence the conflict through which we have just passed will be known as the Spanish-American war, rather than the American-Spanish.

It may seem heartless to see in the loss of the steamer *Portland* a cause of any emotion except profound sorrow, yet, as a matter of fact, the disaster was one so far from accidental, one in which the fixing of direct responsibility is so easy, that he who views only the tragical features of the wreck, and ignores the display either of criminal ignorance or of criminal recklessness that preceded and caused the death of more than a hundred persons, shows sentimentality, not sentiment, and proves that he is not a reasoning being. In leaving Boston Saturday evening, the captain of the *Portland* took chances which no man in his position had a right to take. From a source that warranted implicit belief, he, like every other captain on the Atlantic coast, had received warning that a storm of exceptional severity would strike him as soon as he reached open water, and he knew that his steamer, though well built and comparatively new, was of a type much better designed for entering shallow harbors than for encountering winter gales on as dangerous a coast as there is in the world. Despite all this, and, according to his employers, in defiance of explicit orders, he steamed out into the gathering tempest. Why? He is not alive to explain or excuse his act, or to meet the reproaches of those whose friends and relatives he involved in his own destruction. One can only guess at his motives. Perhaps he desired to justify his recent advancement from pilot to commander by showing that he could carry the *Portland* through any storm. Perhaps he belonged to the class, once large, but now small and rapidly disappearing, the members of which sneer at the Government Weather Bureau, and prefer to rely on old "signs" instead of on new science as the basis of meteorological prophecy. Perhaps—a score of things. Only this is certain: He should not have sailed, and he should not have been allowed to sail. The responsibility is not his alone. Captains do not disobey when owners give absolute orders. Advice and orders are different.

N. Y. Times, Dec. 1, 1898.

I have also found that the visits of bees are necessary for the fertilization of some kinds of clover. For instance, twenty heads of Dutch clover . . . yielded 2290 seeds, but twenty other heads protected from bees produced not one. Again,

100 heads of red clover . . . produced 2700 seeds, but the same number of protected heads produced not a single seed. X
 Darwin : *Origin of Species*, ch. iii.

Among the conversions brought about by the evidence of facts, we may note that of a great Austrian agriculturist, M. Benesch, who for thirty years refused to put faith in the spontaneity of such combustion. Nevertheless, several years ago he was forced to admit it by an accident that occurred at his farm at Meierhof. In an inaccessible barn on a very high scaffold he placed, one after the other, five hundred loads of hay, cereals, and legumes cut green. About the middle of the pile a mass of mixed oats and vetches began to grow hot. The employees of the farm, as well as its owner, did not appreciate the danger, and waited for time to cool this incomprehensible ardor. They fared badly, however, for several days of waiting served only to encourage and make more active the work of the microscopic heaters. At the end of a week a light curl of smoke arose from the barn, and caused disquiet in the farm of Meierhof. M. Benesch, after his unfruitful appeal to time, had recourse to air, whose contact, he thought, would cool off the pile and disperse to the winds the vaporous products of this mysterious effervescence. But scarcely had his laborers reached, with great toil, the centre of the pile, when flames burst out on all sides, transforming the heated forage into an immense furnace. The laborers, indeed, did not get out alive without great effort. Every presumption of incendiarism or the contact of a burning body being impossible to maintain, this fire put an end to the previous skepticism of the proprietor of Meierhof in regard to the spontaneous combustion of hay.

Jean de Loverdo : *La Nature*, Dec. 24, 1898.

“ My fri'nds, Brother Paul tells us that the waages o' sin is death. Now, let's see wuther we kin grasp wot he maan by't. S'pose I wor tu go an' du my haarwest for Mr. H. (a local farmer), an' arter all the wuk wor dun go an' ax Mr. T. (another farmer in the same village) fur my waages, wot du yeou think Mr. T. would saay? Sure-ly he would up an' saay, 'Sam, yeou air a fule. Go an' ax Mr. H. fur yer waages; yeou ha' dun yer haarwest there. Wot du yeou come an' ax me fur yer waages fur?' An' ef I wuk all my loife fur the daavil an' go tu God for my reward he wool saay, 'No, no, Sam; yeou go tu the daavil fur yer reward; yeou hev wuked fur him in the haarwest o' loife; he must pay yeou.' ”

Harper's Weekly promulgates certain theories of Col. Roosevelt's nomination which do not seem to us to be consistent with each other or with the facts. Of Mr. Platt's part in the matter it has this to say :

"At first, we have no doubt, Mr. Platt was determined that Mr. Roosevelt should not be the head of the Republican ticket this year. Events, however, were too strong for the master-boss, and finally he accepted the inevitable, because if he had not he would have been obliged to accept Gov. Black."

But the theory of the popular selection of Col. Roosevelt is weak, and we believe it to be unfounded. The fact that Roosevelt, if eligible, was the strongest candidate the Republicans could name this year became evident to the common mind about the Fourth of July. There is in the service of the Republican Party in the State one uncommon mind that does not wait for the revelation of events. It pierces the future with its own private beams of prescience and usually sees in March what the rank and file of the party and the good men of the Union League Club began to get inklings of along in August. That mind belongs to Thomas C. Platt. So far from being "at first" opposed to the nomination of Roosevelt, we venture to say that Mr. Platt picked him out and intended to nominate him long before his name had occurred to any Republican of prominence or any considerable number of the rank and file of the party. A political stroke of such magnitude and of such wisdom did not have to be forced upon a party leader so capable as Mr. Platt.

Anybody who attempts to trace the Roosevelt boom to its origin will find that it first came to the public notice in the reports brought by the Platt machine leaders from up the State. These gentlemen with a surprising unanimity declared that the people in their districts demanded the nomination of Roosevelt and would take nobody else. There were days when a listener to the conversation of the Republican leaders in the Fifth Avenue Hotel would have concluded that the whole State beyond the Harlem and the Bronx was on fire for the Colonel of the Rough Riders. Such unanimity and such enthusiasm about the choice of the people on the part of politicians who have been accustomed to consult the choice of the boss rather than that of the people excited remark.

I suppose no one will question that the leading Eastern colleges for women are, in order of age, approximately,

Vassar, Wellesley, Smith, Bryn Mawr, Radcliffe, and Barnard. If Miss Willard's friend will consult the catalogues of these colleges, he will find, I think, that many of his suggestions as to ideal courses have already been anticipated; that the colleges themselves, in fact, are leading the way to a truer standard of education. Many of these courses, however, indicate changes in curriculum made within a few years. If the sister and the cousins and the friends were graduated even four or five years ago, they perhaps had no opportunity to elect them. But the point remains that the colleges have recognized the worth of special courses in psychology, pedagogy, hygiene, physical chemistry, chemistry of foods, physiology, social science, social ethics, organized charities, daily themes, æsthetics, history of art, and kindred subjects. These courses, moreover, are offered, as our kind critic suggests would be appropriate, "as electives of equal value with literature and mathematics, and not as added burdens to overworked students." I may add that almost all of these electives attract large numbers of students. At least one college offers a course, under the department of philosophy, in the study of child-nature; and the same college has a course devoted to a study of the organized charities of the city in which it is situated. That the head of the department of history in another college has published the most important work of the present day on "Domestic Service," goes to show that such subjects are at least not despised in the colleges for women. I do not present these instances as evidence that all the work done in women's colleges is differentiated to meet the special needs of women, but only as evidence, so far as it goes, that there is a marked tendency in that direction. I question, indeed, whether the colleges are not moving as rapidly in this matter as the public can follow—the limit of any reform, history tells us.

To the second charge, "Imitation of man," we must again, I fear, plead guilty. The university professor who is quoted as saying that "the women will not have any improvement; they wish just the same education as the college men, not a better one," undoubtedly voiced the ideal of the average college girl, at least before she enters college. But, fortunately for her and for her womanhood, she does not, in most colleges, control either the curriculum or the environment of four of the most impressionable years of life; and this environment, in spite of the charge brought against it of "Lack of refining influences and tendencies," is often the most culturing influence of her life. In most of the leading colleges for

women, art and music are recognized as educational forces, and more or less provision is made for them. In one well-known instance the school of music connected with the college is so managed that its concerts, analysis classes, and rehearsals form a natural part of the college life. The same college has a fine art-gallery, and frequent talks on art are open to the students. Most colleges, too, provide lectures by specialists on music, art, and literature. Much that is beautiful in life comes thus naturally into the life of the college girl. She is, moreover, surrounded by refined and cultured men and women, in spite, again, of the indictment, "Lack of social training." If Miss Willard's friend has time for a tour of the colleges, he can find no better refutation of his theory that they lack refining influences than the students themselves. The difference between the senior and freshman class of any college is one of the marked features of college life; that in women's colleges this difference is chiefly in the direction of greater womanliness and refinement is perhaps sufficient evidence of the influences at work. Some of the finest women I have known have been members of college faculties. That their very fineness is an indirect argument for celibacy, as suggested, is perhaps true. But why assume, *a priori*, that this is necessarily a misfortune? When I was a freshman in college, I remember, the wife of the president called individually on each member of the freshman class. I should not like to be cited as maintaining that a ten-minutes social call, even from the wife of a college president, would leaven the four years of college life. But the college that can thus take thought for its freshmen is not likely to neglect entirely the social graces of life. Using the word social in its broader sense, if the colleges for women fail to give their students an interest in the problems of humanity, as asserted, is it not a little singular that one of the most effective philanthropic movements of the day should be known as the College Settlement?

Jennette Barbour Perry: *The Critic*, Sept. 11, 1897.

Now let us consider the prospect. If the South becomes a slave empire, what relation will it have to you as a customer? It would be an empire of twelve millions of people. Now, of these, eight millions are white and four millions black. Consider that one third of the whole are the miserably poor, unbuying blacks. You do not manufacture much for them. You have not got machinery coarse enough. Your labor is too skilled by far to manufacture bagging

and linsey-woolsey. One other third consists of a poor, unskilled, degraded white population; and the remaining one-third, which is a large allowance, we will say intelligent and rich.

Now here are twelve millions of people, and only one-third of them are customers that can afford to buy the kind of goods you bring to market. Two-thirds of the population of the Southern States to-day are non-purchasers of English goods. Now you must recollect another fact—namely, that this is going on clear through to the Pacific Ocean; and if by sympathy or help you establish a slave empire, you sagacious Britons are busy in favoring the establishment of an empire from ocean to ocean that would have the fewest customers and the largest non-buying population.

Beecher: *Liverpool Speech.*

Many distinguished Englishmen have had some favorite physical amusement that we associate with their names. It is almost a part of an Englishman's nature to select a physical pursuit and make it especially his own. His countrymen like him better for having a taste of this kind. Mr. Gladstone's practiced skill in tree-felling is a help to his popularity. The readers of Wordsworth, Scott, and Byron all remember that the first was a pedestrian, the second a keen sportsman, and the third the best swimmer of his time. The readers of Keats are sorry for the ill-health that spoiled the latter years of his short life, but they remember with satisfaction that the ethereal poet was once muscular enough to administer "a severe drubbing to a butcher whom he caught beating a little boy, to the enthusiastic admiration of a crowd of bystanders." Shelley's name is associated forever with his love of boating and its disastrous ending. In our own day, when we learn something about the private life of our celebrated contemporaries, we have a satisfaction in knowing that they enjoyed some physical recreation; as, for example, that Tyndall is a mountaineer, Millais a grouse-shooter, John Bright a salmon-fisher; and it is characteristic of the inveteracy of English physical habits that Mr. Fawcett should have gone on riding and skating after he was blind, and that Anthony Trollope was still passionately fond of fox-hunting when he was old and heavy and could hardly see. The English have such a respect for physical energy that they still remember with pleasure how Palmerston hunted in his old age, and how, almost to the last, he would go down to Epsom on horseback. There was a little difficulty about

getting him into the saddle, but, once there, he was safe till the end of his journey.

Hamerton : *French and English*, p. 2.

Examination—thorough, searching examination—is an indispensable accompaniment of teaching; but I am almost inclined to commit myself to the very heterodox proposition that it is a necessary evil. I am a very old examiner, having for some twenty years past been occupied with examinations on a considerable scale, of all sorts and conditions of men, and women too, from the boys and girls of elementary schools to the candidates for honours and fellowships in the universities. I will not say that in this case, as in so many others, the adage that familiarity breeds contempt, holds good; but my admiration for the existing system of examination and its products does not wax warmer as I see more of it. Examination, like fire, is a good servant, but a bad master; and there seems to me to be some danger of its becoming our master. I by no means stand alone in this opinion. Experienced friends of mine do not hesitate to say that students whose career they watch appear to them to become deteriorated by the constant effort to pass this or that examination, just as we hear of men's brains becoming affected by the daily necessity of catching a train. They work to pass, not to know, and outraged science takes her revenge. They do pass, and they don't know. I have passed sundry examinations in my time, not without credit, and I confess I am ashamed to think how very little real knowledge underlay the torrent of stuff which I was able to pour out on paper. In fact, that which examination, as ordinarily conducted, tests, is simply a man's power of work under stimulus, and his capacity for rapidly and clearly producing that which, for the time, he has got into his mind. Now, these faculties are by no means to be despised. They are of great value in practical life, and are the making of many an advocate, and of many a so-called statesman. But in the pursuit of truth, scientific or other, they count for very little, unless they are supplemented by that long-continued, patient "intending of the mind," as Newton phrased it, which makes very little show in examinations. I imagine that an examiner who knows his students personally must not unfrequently have found himself in the position of finding A's paper better than B's, though his own judgment tells him quite clearly that B is the man who has the larger share of genuine capacity.

Huxley : *Science and Culture*.

It has become fashionable of late to relate the small weaknesses, and, in some instances, the large, as seen in conspicuous characters. Parton has given us the unfavorable side of Hamilton; Burr has been a particular mark to aim at; Washington has not escaped, and we are now to have such a portraiture of Franklin.

It is a fact of common experience in this country that a switchmen's strike is the ugliest of all strikes, and the one most difficult to deal with. The Buffalo strike has been in keeping with all that we know about these affairs. The New York Central switchmen "went out," not because of any grievance of their own, but because the others went out. The Buffalo and Pittsburgh men struck, and the company acceded to their demands, but they refused to go to work until the Erie and Lehigh Valley companies should yield to their men. All this would be endurable if the men would go about their business and leave other people and other people's property alone. But this they will not do. No sooner do they "go out" than they organize themselves as brigands, and proceed to burn and wreck and kill and maim wherever an attempt is made to operate the roads that they have abandoned. They must be put down, they must be made to suffer the consequences of their riotous acts; but that ought not to be the end of the affair. These railroad interruptions ought to be made impossible. So many interests are affected by a stoppage of traffic that the State ought to intervene in some effectual way to insure the continuous and regular movement of trains. The Railroad Commissioners of this State pointed out the need of such legislation several years ago, and showed the equity as well as the necessity of it. Of course, men cannot be compelled to work on railways more than in factories against their will, but they can be, and should be, required to give reasonable notice of their intention to quit; so that their places may be filled and the movement of traffic continued. The employers should be equally required to give notice of intention to "lay off" any hands in their employ. Railway and telegraphic service should be made subject to army discipline, the obligations being mutual between employer and employed. *A fortiori* the forcible stoppage of trains by hands who have discharged themselves from service without a moment's warning, and even after their demands have been complied with, should be dealt with in the most summary manner with all the power of the State.—*Nation*, 55: 135.

The *Economist* thinks that it is hardly possible to over-estimate the good effect, in calming the panic, of telegraphic communication with Europe. It is only fair to admit, of course, that there is a drawback at times in the "echoing-power" of the cable, each money market being troubled by bad news of the other, and the bad news tending to accumulate; but the telegraph works against panics in two important ways. It has, in the first place, materially shortened the time within which assistance can be rendered. The failure of Jay, Cooke & Co. was almost immediately followed by the shipment of gold from Europe. But, in the second place, the shipment of gold has an effect before it arrives, because the telegraph announces it, and the mere knowledge that gold is on the way is likely to allay panic and revive credit. In 1857 the crisis broke out about the end of September, but the news did not reach England till the middle of October, and this country had a whole month to live without receiving help, or knowing of its probable arrival.

Nation, 17: 265.

No body can be healthful without exercise, neither natural body nor politic; and certainly to a kingdom or estate, a just and honorable war is the true exercise. A civil war, indeed, is like the heat of a fever, but a foreign war is like the heat of exercise and serveth to keep the body in health.—Bacon: *Civil and Moral Essays*, p. 207.

Chief Justice Morse of the Michigan Supreme Court, whom the Democrats of that State have nominated for Governor, is a man well qualified for an executive position, but it may be doubted whether it was good policy for the party to take its candidate from the bench. The Constitution of the State provides that no judge of the Circuit Court shall be eligible to any other than a judicial office during the term for which he is elected, and for one year thereafter, and that all votes given for such judge for any such (inhibited) office or appointment, whether by the Legislature or the people, shall be void. No mention is made of judges of the Supreme Court, but of course every argument which applies to the lower court has equal weight in the case of the higher; and while there is no legal prohibition of Mr. Morse's candidature, it is morally forbidden by the plain intent of the framers of the Constitution. The feeling against going to the bench after a nominee for a non-judicial position is very

strong in this country, and seems to be growing stronger. It is not wise for a party to fly in the face of it.

Nation, 55: 136.

A professional man is scarcely equipped and started in his profession before he is thirty; a business man, if he is on the road to success, is much nearer prosperity at thirty-five than at twenty-five, and it is therefore wise for these men not to marry in the twenties. But this does not apply to the working man. In many trades he is laid upon the shelf at thirty-five, and in nearly all trades he receives the largest wages of his life between twenty and thirty. If the young workingman has all his wages too long to himself he will probably establish habits of personal comfort which he cannot keep up when he has to divide with a family—habits which, perhaps, he can never overcome.—Jane Addams: *The Subtle Problems of Charity*, *Atlantic Monthly*, 83; 170.

By midsummer we often find ourselves scarcely noticing the leaves, unless there is about them some novel feature that strikes our attention, such as an added glow of freshness from dew or rain, a pleasant noise from their rustling in the wind, or the tossing of the branches in a storm. After a change of boarding place, persons often think the food at a hotel is unusually good; but the bill of fare varies little from day to day, and finally the viands seem so monotonous that but slight pleasure is experienced in eating. Druggists say that they often sell a great deal of soda water in the spring before it is very warm. This drink then seems unusually good, because none has been tasted for a long while. They allow the boys who tend the fountain to drink all they choose. For the first few days the boys consume a great deal, but they become less and less fond of it.—Halleck: *Education of the Central Nervous System*, p. 248.

"Thinking freely of religion may be involuntary with this gentleman; so that allowing his sentiments to be wrong, yet as he is purely passive in his assent, he is no more to be blamed for his errors than the governor of a city without walls for the shelter he is obliged to afford an invading enemy."

"True, my son," cried I, "but if the governor invites the enemy there he is justly culpable. And such is always the case with those who embrace error."—Goldsmith: *Vicar of Wakefield*.

What do we know about this characteristic smell of the soil? Can we regard it as the mere attribute of the soil as a simple substance, such an attribute as is, for instance, the peculiar smell of leather, or the odor of india-rubber? or can we go deeper and find that it is really an expression of complexity below?

Strangely enough this is the case, for the smell of damp earth is one of the latest sign-posts we have found which lead us into a world which, until recently, was altogether beyond our ken. It points us to the presence, in the ground beneath us, of large numbers of tiniest organisms, and not merely to their presence only, but to their activity and life, and reveals quite a new phase of this activity. A handful of loose earth picked up in a field by the hedgerow, or from a garden, no longer represents to us a mere conglomeration of particles of inorganic mineral matter, "simply that and nothing more"; we realize now that it is the home of myriads of the smallest possible members of the great kingdom of plants, who are, in particular, members of the fungus family in that kingdom—plants so excessively minute that their very existence was undreamt of until a few years ago.

But up to the present the fresh smell of the earth, the smell peculiar to it, has not been in any way associated with these energetic organisms, and it is quite a new revelation to find that it is a direct outcome of their activity. Among the many bacteria which inhabit the soil, a new one, hitherto unknown, has been just recently isolated and watched. It lives, as is usual with them, massed into colonies, which have a chalky-white appearance, and as it develops and increases in numbers it manifests itself by the familiar smell of damp earth; hence the name that has been given it—*Cladothrix odorifera*. Taken singly it is a colorless, thread-like body, which increases numerically by continuous subdivisions into two in the direction of its length. It derives its nutriment from substances in the soil, which either are, or have been, touched by the subtle influence of life, and in the processes of growth and development it evolves from these materials a compound whose volatilizing gives the odor in question. This compound has not yet been fully examined; it is not named, nor have all its properties been satisfactorily elucidated, but two facts concerning it stand out clearly. One is that it is the true origin of the smell that we have hitherto attributed to earth simply; and the other, that it changes into vapor under the same conditions as water does. Therefore, when the sun, shining after the rain, draws up the water

from the earth in vapor form, it draws up, too, the odorous atoms of this newly found compound; and these atoms, floating in the air, strike on our olfactory nerves, and it is then we exclaim so often, "How fresh the earth smells after the rain!"

The moisture, to a certain extent, is a necessary condition of the active work of these bacteria, yet the chief reason why the earthy smell should be specially noticeable after the rain is probably because this compound has been accumulating in the soil during the wet period. We only smell substances when they are in vapor form, and since the compound under consideration has precisely the same properties in this respect as water, it will only assume gaseous form when the rain ceases. The bacteria have, however, been hard at work all the time, and when the sun shines and "drying" begins, then the accumulated stores commence their transformation into vapor, and the strong smell strikes upon our senses. For the same reason we notice a similar sort of smell, though in a lesser degree, from freshly turned earth. This is more moist than the earth at the surface, and hence, on exposing it, evaporation immediately begins, which quickly makes itself known to us through our olfactory nerves.

It may also have been remarked that this particular odor is always stronger after a warm day than after a cold one, and is much more noticeable in summer than in winter. This is because moderate warmth is highly conducive to the greater increase of these organisms, and, in fact, in the summer they are present in far larger numbers and exhibit greater vitality than in the winter, when they are often more or less quiescent.

Two other characteristics of *Cladothrix odorifera* are worthy of notice as showing the tenacity with which it clings to life. It is capable of withstanding extremely long periods of drought without injury; its development may be completely arrested (for water in some degree is a necessity with all living things, from highest to lowest), but its vitality remains latent, and with the advent of water comes back renewed activity. But besides drought it is pretty well proof against poisons. It can even withstand a fairly large dose of that most harmful poison to the vegetable world, corrosive sublimate. Hence any noxious matter introduced into the soil would harm it little ultimately; the utmost it could do would be to retard it for a time.

This, then, is the history of the smell of earth as scientists have declared it unto us, and its recital serves to further

point the moral that the most obvious, the most commonplace things of every-day life—things that we have always taken simply for granted without question or interest—may yet have a story hidden beneath them. Like sign-posts in a foreign land, they may be speaking, though in a language not always comprehended by us, of most fascinating regions, regions we may altogether miss to our great loss, if we neglect ignorantly the directions, instead of learning to comprehend them. G. C. Nuttall: *Knowledge*, Feb. 1899.

The lioness nurseth her whelps, the raven cherisheth her birds, the viper her brood, and shall a woman cast away her babe?
Lyly: *Euphues*.

A striking illustration of this was shown in the case of a gosling which was reared in a kitchen away from water. After several months it was taken to a pond, but refused to go in. When . . . thrown in, it hurried out, like a hen, in a frightened way. The desire for swimming had been suppressed. . . . A short time after hatching, the clucking of a hen will develop motor reactions which cause . . . [the chicks] to follow her. If . . . [they] are kept away from the hen for a week, the clucking never calls forth the usual motor response, but they will then follow the whistle or call of any person to which they have been accustomed from birth. A puppy brought up on a hard floor will frequently make a feint of burying a bone, but as the early environment is unsuitable for developing the instinct, it is often altogether abandoned, although the grown dog may be allowed to wander at will where the earth is soft. Darwin found that a species of caterpillar naturally fond of the leaves of a certain kind of plant would soon lose its liking for them, if accustomed at birth to eat a different leaf. So pronounced does this dislike become that worms have been known to die rather than eat the favorite leaf of the species, if they have been reared on different food.—Halleck: *Education of the Central Nervous System*, p. 245.

APPENDIX E.

UNCLASSIFIED PROPOSITIONS FOR ARGUMENT.¹

1. Railroads raise the level of general intelligence.
2. Delays are dangerous.
3. A protective tariff fosters trusts.
4. American men are wholly absorbed in business.
5. Climatic conditions influence national character. ✓
6. Women are illogical.
7. The English language is unmusical.
8. Letter-writing is in general a waste of time. ✓
9. The moral influence of the Salvation Army justifies its existence.
10. Indian corn ought to be adopted as our national floral emblem.
11. The health of college² girls improves during their course.
12. Constantine's conversion was the result of religious conviction.
13. Hamlet was insane.
14. Like father, like son.
15. A policy of imperialism should be adopted by the United States.
16. The people always conquer.
17. In novels the blonde women always win away all the happiness from the dark ones. (Maggie's observation, *Mill on the Floss*, Bk. V., ch. IV.)
18. The prices of staple commodities are much the same in every part of the civilized world.
19. Women should receive the same salaries as men for the same work.

¹ The student should be required to determine for himself, whether he ultimately writes the argument or not, what form of reasoning is necessary to establish each of these conclusions.

² A particular college may be specified.

20. Students in college should help to frame the laws by which they are governed.

21. People always admire in others the qualities which they themselves lack.

22. Friendships between men are stronger than those between women.

✓ 23. All college courses should be elective.

24. Mars is inhabited.

25. A socialistic order of society will remove the incentive to labor.

26. Precocious children do not fulfill their early promise.

27. Kindergarten methods do injury to the mind of the average child.

28. Women's clubs are a positive influence for good upon the community.

✓ 29. All art is an expression of the personality of the artist.

30. The expenditure of money for luxuries is morally indefensible.

31. All so-called "eras of prosperity" in the United States are a misfortune to the laboring man.

32. Every tramp ought to be sent to prison and put at hard labor.

33. A belief in immortality is reasonable.

34. Bicycle-riding is physically beneficial to women.

35. A college education crushes out originality.

36. College graduates fail to reach literary eminence.

37. Strikes aid the cause of labor.

38. The character of the heroine in Meredith's *Diana of the Crossways* is inconsistently represented.

39. All land should be owned by the national government.

40. A man is known by the company he keeps.

✓ 41. Familiarity breeds contempt.

42. Railroads make little profit on their passenger traffic.

43. A protective tariff is an injury to the farmer.

44. Bicycles should be carried free by the railroads.

✓ 45. College graduates should be preferred to graduates of state normal schools as public school teachers.

46. War never pays.

47. Students at.....¹ work at least.....² hours a day.

48. The students at.....¹ keep conscientiously the rule which.....³.

¹ Name school or college.

² Specify number of hours.

³ Specify the rule.

49. The office of poet-laureate should be abolished.
50. Great poets are always good men.
51. The use of the boycott by trades-unions is wrong.
52. Women writers lack creative power.
53. The architecture of all ancient cities reflects the civilization which gave rise to it.
54. The education of girls should be different from that of boys.
55. Cheap dress materials never pay.
56. Alms should never be given to beggars except through a regular charitable organization.
57. The establishment of orphan asylums is an injury to society.
58. Public libraries, museums, and art-galleries should be open to the public on Sundays.
59. Colleges should be situated in the country.
60. Second thoughts are best.
61. Presidential candidates who stump the country in their own behalf are always defeated.
62. The study of both ancient and modern languages will some day be relegated to the preparatory schools.
63. An intimate knowledge of the Bible is essential to literary success.
64. Horses will become extinct.
65. Basket-ball is a dangerous game.
66. Books written for children lack fine literary quality.
67. Reading newspapers is profitable.
68. Executions should be secret.
69. Voting should be compulsory.
70. For the average student a large college has greater educational value than a small one.
71. Students from families belonging to a certain religious denomination should attend a college controlled by that sect.
72. Reading periodical literature is a waste of time.
73. The short skirt will ultimately be adopted by women for all street wear.
74. Dormitory life at college is unhealthful.
75. Lynching is sometimes justifiable.
76. Voters should always support the regular party nominees.
77. Absolute power produces a despotic spirit.
78. Valedictorians are not conspicuously successful in later life.
79. The life of women in the nineteenth century is extremely complex.

80. Poverty will always exist.
81. The negro will sometime be the intellectual equal of the white.
82. Poetry declines as science advances.
83. "Neither shall they make war any more."
84. The American war with Spain was unjustifiable.
85. Heredity is a force stronger than environment in the determination of individual character.
86. Children should not be led to believe the myth of Santa Claus.
87. All colleges will ultimately be coeducational.
88. "College settlements" do more harm than good.
89. English will be the universal language.
90. Popular hymns have a deleterious influence on the literary taste of the masses.
91. Character is indicated by the hands.¹
92. States fall not by the sword of the conqueror, but because of internal weakness.
93. All great movements of thought are reactionary.
94. The church of the future will be institutional.
95. The best is always the cheapest.
96. The modern churches are made up of women.
97. Labor-saving machinery is a benefit to the working man.
98. Orderly habits save time.
99. Lazy people take the most pains.
100. Social settlements should be supported by the city government.
101. *Beowulf* was written by one person.
102. "All art does but consist in the removal of surplussage." (Pater, *Essay on Style*.)
103. Our pension system should be abolished.
104. Prison labor ought not to be brought into competition with free outside labor.
105. The President of the United States should be elected for six years and be ineligible for re-election.
106. Railroads tend to make prices uniform all over the world.
107. Undergraduate students should not devote themselves to a single line of study.
108. Sermons should be limited to thirty minutes in length.
109. Browning's poems are without musical quality.

¹ Or by the features, gait, dress, handwriting, etc.

110. Money dishonestly acquired does its possessor no good.

111. Christian science "healing" should be prohibited by law.

112. Children should be allowed to eat all the candy they want.

113. A system of self-government should be introduced into primary and secondary schools.

114. Under existing conditions, the abolition by all civilized nations of their armies and navies other than those required for the maintenance of their domestic police is feasible.

115. The United States should adopt a policy of colonial expansion.

116. George Eliot's minor characters are more distinctly drawn than are her heroes and heroines.

APPENDIX F.

BIBLIOGRAPHY.

THE bibliography of argumentation is as yet meager. Baker's *Principles of Argumentation* was first in the field, followed recently by MacEwan's *Essentials of Argumentation*. These two treatments of the subject differ widely in the stress they lay upon the logical substratum of argument, Mr. Baker taking it for granted and Mr. MacEwan expounding it in detail. Baker's *Specimens of Argumentation* may be considered supplementary to the *Principles*.

To these books must be added the contributions made by some of the standard treatises on rhetoric, both ancient and modern. We find a large part of Aristotle's and Quintilian's discussions concerning rhetoric devoted to "persuasion," in which argument was regarded as a factor of varying importance. Campbell and Whately perpetuate this proportion. The modern rhetoricians as a class devote scant space, or none at all, to argumentation, and those who consider it have thrown little new light upon its problems.

Books of logic must inevitably be consulted by the student of argumentation. Of these, Jevons' *Elementary Lessons* is perhaps the simplest and most compact, though Bosanquet, Lotze and Fowler dig deeper. Both real and formal logic, it will be noticed, are represented in this bibliography, inasmuch as both contribute to a conception of logic as the explicit formulation of the typical modes of thought.

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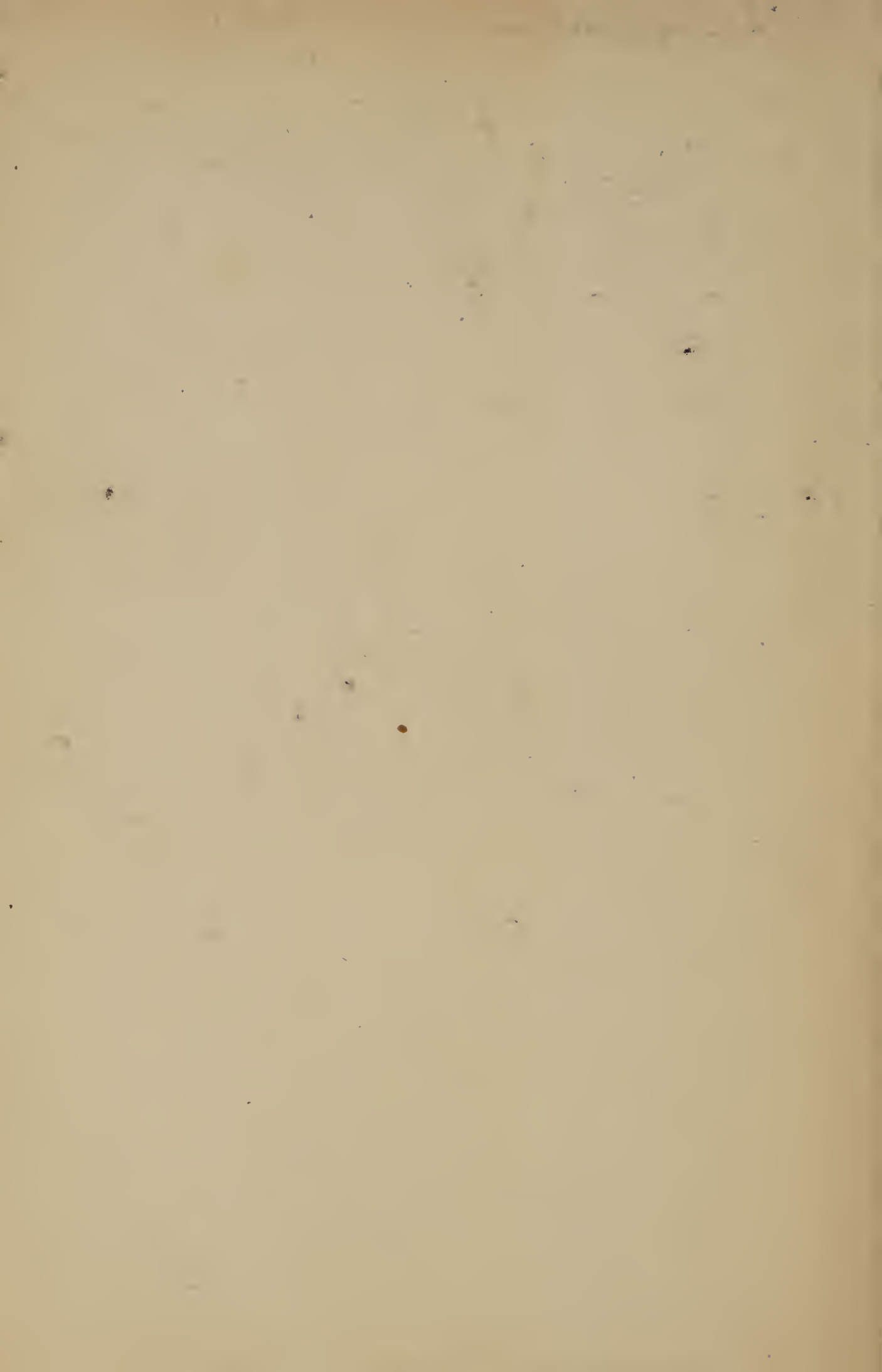
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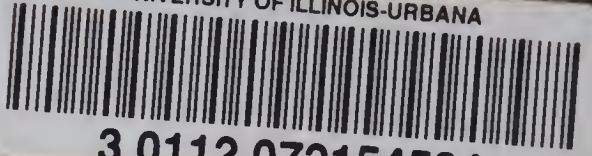
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